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THE
OPHTHALMIC RECORD

A Monthly Review of the Progress of
Ophthalmology.

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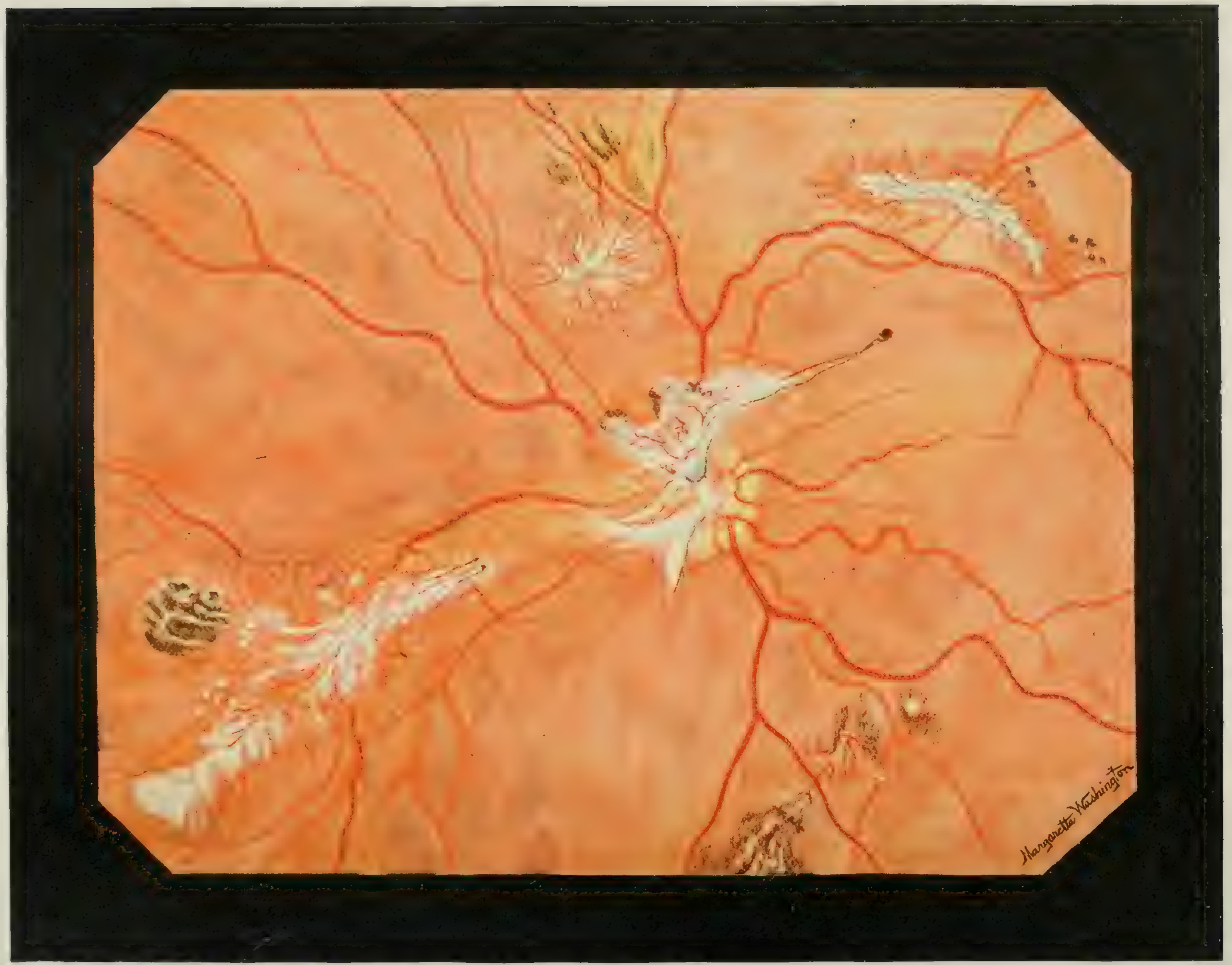

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VASCULAR NEW FORMATIONS IN THE VITREOUS. - - De SCHWEINITZ.

THE
OPHTHALMIC RECORD

A MONTHLY REVIEW OF THE PROGRESS OF OPHTHALMOLOGY.

VOLUME VII. CHICAGO, JANUARY, 1898. NO. 1. NEW SERIES

ORIGINAL ARTICLES.

BLOOD VESSEL FORMATION IN THE VITREOUS.

BY G. E. DE SCHWEINITZ, A. M., M. D.,
OF PHILADELPHIA.

(With colored frontispiece.)

Blood vessel formation in the vitreous in front of the entrance of the optic nerve is an occasionally encountered, striking ophthalmoscopic picture. Only a few vessels may be present, or the entire disc, as in a case reported by Dr. Harlan, may be obscured by a congeries of contorted vessels, the whole forming an extensive vascular veil of anastomosing capillaries, coming directly from the nerve-head and having no connection with the retinal vessels.

In the disease called proliferating retinitis, in which a tissue of bluish-white color develops from the retina and stretches out into the vitreous humor, the masses may follow the course of the blood vessels, which in part lie beneath them and in part pass over them. Those vessels which lie above the masses are occasionally newly formed blood vessels.

Somewhat partaking of the nature of such cases is the following:

J. D. B., a man aged twenty-six, born in North Carolina, single, clerk, consulted me on the 28th of July, 1897, complaining of pain in and around the left eye.

History.—With the exception of measles in childhood, the patient has not suffered with any illness severe enough to confine him to bed. In December, 1895, he is said to have contracted syphilis, and has been under treatment ever since. His physician, however, has failed to observe secondary symptoms in the skin or mucous membranes, and thinks that what was supposed to be the initial lesion of syphilis was a herpetic bleb on the prepuce. Both parents are living and in good health. Two brothers are alive and healthy. One brother died from heart disease and another from typhoid fever. The pain in the left eye, which caused him to seek advice, began eighteen months before his visit, and has continued ever since in spite of treatment which has included both medicinal and optical therapeutics.

Examination.—The patient is a tall, apparently healthy, man, and physical examination failed to reveal the signs of any disease, save those connected with his eyes.

Eyes.—V. of R. E., after the correction of one dioptre of hypermetropia, $\frac{6}{5}$. The media are clear; the disc is a vertical oval, of good color, with slight broadening of the scleral ring on the temporal side, and beyond this a slight choroidal crescent. The arteries are normal in size, and the veins somewhat fuller than normal. Both sets of vessels carry blood of natural tint. No retinal or choroidal lesions are present.

V. of L. E., after the correction of a quarter of a dioptre of astigmatism, axis 150, $\frac{6}{5}$. The optic disc is a vertical oval, of somewhat pallid color, and springing from it there is a greenish-white mass of the type usually seen in proliferating retinitis, which carries a veil of anastomosing bloodvessels, and terminates in several clump-like dark bodies, one extending forward into the vitreous 7 dioptres. Similar patches of greenish-white connective tissue are visible above the disc, above the macula, and downward and inward along the course of the inferior nasal vessels and directly downward below the disc. These masses vary in prominence in the vitreous, the surface of that above the disc being + 6 D., of that above the macula + 7 D., of that below the disc between 5 and 6 D., and of that in the lower nasal fundus between 3 and 4 D. In immediate connection with the patch above the disc is an area of retino-choroiditis, and some of the blood vessels can be traced directly to this patch. No direct connection with the fundus could be seen in the other masses. Directly in the macula are a few faint lines, such as are usually produced by slight œdema. The vitreous is perfectly clear, and the function of the eye seems normal, as none of the masses obscure the macular region, and the slight lines of œdema appear not to influence the visual acuity of the eye. The accompanying frontispiece, reproduced from a water-color by Miss Margaretta Washington, gives a very fair idea of these lesions.

The *treatment* consisted of iodide of potassium and bichloride of mercury, and the correcting lenses as recorded were ordered. The patient has not been seen since the first week in August.

Appearances such as these are usually ascribed to repeated hemorrhages. Recently, Weeks has examined an eye with proliferating retinitis and his findings (published in the *New York Eye and Ear Infirmary Reports*) throw light upon the formation of new blood-vessels. The membranes, he believes, are "organized clots, which, before organization, may be fibrin only, or fibrin and blood corpuscles. The process which determines the production of the membranes appears to be as follows: Partial obstruction to the arterial circulation from the arterial fibrosis, to the venous circulation from the sluggish blood current and in small degree from fibrous degeneration of the walls of the veins, occasions venous engorgement at favorable points, a distension of the veins, with tortuosities and, perhaps, new-formed venules. Later a transudation of the fluid and fibrin-forming elements into the vitreous takes place which may extend to some distance from the retina. Some hemorrhage may take place at the point from which the fibrinous exudation has proceeded. Formative cells are projected into this layer of fibrin or blood clot, and thin-walled blood-vessels and fibrous tissue result. Hemorrhage occurs from the vessels which are formed in the new membrane, probably much more frequently than from the remaining vessels in the retina."*

*A still more recent study of Retinitis Proliferans has been published by Dr. Weeks in the Tran. Amer. Ophth. Soc. 1897, Vol. viii, p. 158. For full particulars of this affection, the reader is referred to this admirable paper.

KERATECTASIA, REPORT OF A CASE WITH TRANSPARENT CORNEA.

BY FRANK C. TODD, M. D.

Instructor in Ophthalmology and Otology in the Medical Department of the University of Minnesota.

MINNEAPOLIS, MINN.

A comprehensive description of ectasiæ of the cornea is given in Fuchs. He classifies ectasiæ as follows:

Ectasiæ of inflammatory origin— { Staphyloma, Keratectasia.

Ectasiæ of non-inflammatory origin— { Keratoconus, Keratoglobus.

Staphyloma is defined as "a protuberant cicatrix originating in a prolapse of the iris, and wholly or in part replacing the cornea."

Keratectasia *is "a protrusion of the cornea which makes its appearance after inflammation of the latter, without, however, any perforation having taken place.** The protrusion, therefore, in this case consists of corneal tissue, in contradistinction to staphylomata, in which it is formed of the tissue of the iris. From ectasiæ of the cornea of non-inflammatory origin —i. e., Keratoconus and Keratoglobus—the inflammatory ectasia is distinguished by the fact that the bulging portion of the cornea, in consequence of the inflammation, *is opaque*." * Definitions given by other authorities are essentially the same, all stating that ectasiæ of inflammatory origin are opaque.

* Italics mine.

The case which I have to report is, therefore, unique in that it is of inflammatory origin, not a staphyloma, and is transparent. It is, therefore, a case of *Keratectasia not opaque.*

Mr. K., aged 60, sustained an injury to his eyes while in battle in 1861. A gun was discharged very close to them. An inflammatory re-action followed, involving the corneæ and irides, leaving in its train posterior synechia and changes in the shape and appearance of the corneæ. It does not appear from the history that the immediate inflammatory reaction involved the posterior portions of the globes, for the patient retained useful vision for twenty years, though repeated exacerbations followed, and his vision gradually decreased until he became totally blind in the left eye, and the vision in the right eye was reduced to shadows. Portions of the left cornea are opaque over the pupil and inferiorly, but the major part is transparent. The pupil is contracted and iris bound down by posterior synechia. Fundus could not be seen. Right eye (shown in illustration) same as left, but *cornea entirely transparent.* Ophthalmoscopy shows extensive choroidal atrophy, no field being clear, with atrophy of the optic nerve.

As may be imagined, the patient presented a ghastly appearance. The corneæ drooped out of the lids like two pouches distended with water, and were fastened above to the scleræ, and supported beneath by the lower lids.

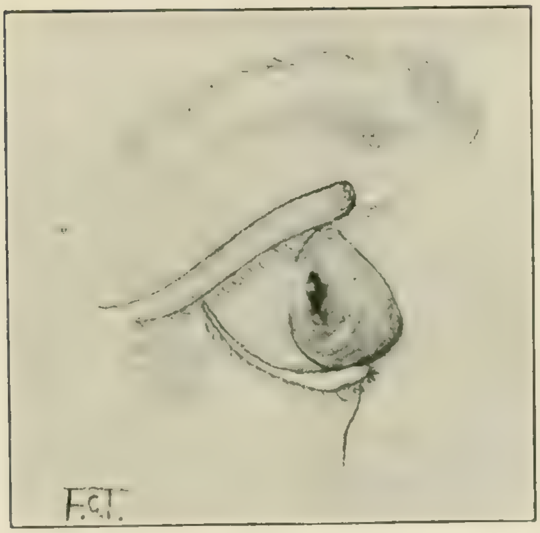
No. 602 Nicollet Ave.

SOME POINTS IN RETINOSCOPY.

BY HELEN MURPHY, M. D.
Instructor in Diseases of Eye in Philadelphia Policlinic.
PHILADELPHIA.

The average student of retinoscopy seems to be sublimely indifferent to the fact that it is a science, as well as an art. In fact, few seem to realize at all that it is a science, and a complicated one, but imagine, when they have mastered a few simple rules as to its application, and have cultivated their light-sense up to the point of differentiating between the central and peripheral area of illumination, that they have exhausted the subject. But, the fact that the optics of the test is not studied and understood as it should be, often leads to confusion and inexactness in the application of the rules, and sometimes to very absurd blunders.

Because exact rules are given as to the proper position of the original source of light, an impression seems to have been created, in a great many students' and practitioners' minds, that the refractive appearances of the eye under observation are affected by this position; that is, that the direction of the rays proceeding from the illuminated eye depends on the



Right Eye—Showing Keratectasia, with Transparent Cornea.

amount of divergence or convergence of rays entering the same. A recent contributor to an ophthalmological journal left his readers to infer that, by moving his source of light one meter farther from his patient's eye, he could bring the point of reversal for that eye one meter closer, and actually devised an elaborate apparatus for the purpose of performing this impossible feat. The error is one so common it is well to say a few words to do away with it. Those who make it imagine the area of illumination which we study is an image of the source of light projected on the retina as on a screen, and returned to the dioptric apparatus by the laws of regular reflection. That the retina does sometimes act as a screen reflecting back the illuminating object, is seen with especial plainness in ophthalmoscopy, where an image of the gas jet is often observed interfering more or less with the study of the fundus. But, as in ophthalmoscopy, it is not an accidental image, but the fundus which we wish to study, so it is in retinoscopy. Our object in using the mirror is to illuminate the eye-ground. The retina, not being a polished surface, we see it as we do all objects by *irregularly* reflected or diffused light, and it is on the relation of this illuminated object to the focal point of the dioptric media that the refractive appearances of the eye depend. If the observer sits one meter in front of an emmetropic eye, with the light close to the mirror, it will require a one diopter convex lens to focus the parallel rays from that eye on his own retina. The rays from the mirror —if a plane one is used—having a divergence of one diopter, will be focused by the lens at the same time on the retina of the observed eye. If the light is moved four meters back from the observed eye, so that the rays traverse six meters before entering the same, and are, therefore, practically parallel, yet it will still require the same one diopter lens to focus them on the observer's eye; and at the moment they are focused on the observer's eye they are thrown out of focus on the observed eye. And yet the only difference in the appearance in the two cases is that in the first the area of illumination appears slightly smaller, brighter, and more clearly defined. The point at which all movement ceases is exactly the same in both.

The apparent size of the area of retinal illumination is not directly related to its actual size in the observed eye, but to the size of its image in the observer's eye. This is shown by case number two above, where the one diopter lens, by focusing in the vitreous of the observed eye enlarged the area of retinal illumination by diffusion circles, while at the same time reducing its apparent size to a minimum by focusing the returning rays on the observer's retina. The apparent size is subjective, and is based on the law that the distance of two objects being known to be the same, their size is estimated from the size of the retinal image, and in perfect focusing this image impinges on the smallest possible number of rods and cones. In other words, a large object perfectly focused appears smaller than a small object imperfectly focused. Of course, when conditions are parallel, the size of the image holds a direct ratio to the size of the object. It is only in astigmatism that very exact focusing of the light on the patient's retina assumes much importance in this condition, giving, as Dr. Jackson has shown in "Skiascopy," a more distinct boundary line between illumination and so-called "shadow" along the edge of the astigmatic band, and thus making the direction of the axis more apparent.

That the apparent size of the area of illumination in the observed eye is dependent upon the number of rods and cones stimulated in the observer's eye, is shown in a different way in spherical aberration, where this element in the estimation of size neutralizes the magnifying power of the observer's eye. According to the laws governing the projection of vertical images, the largest image of the observed fundus should be obtained with the eye at the point of reversal, while in reality the area of retinal illumination seems to grow smaller and smaller as this point is approached, while the illumination in that part of the pupil whose focal point is being receded from grows proportionately larger.

Because perfect focusing of the light on the patient's retina is not important, except in cases of astigmatism, it does not follow that the position of the light in relation to the mirror is a matter of indifference in cases of simple myopia and hypermetropia, for the intensity of the illumination depends on the distance of the light from the mirror, and the amount of obliquity with which the rays strike its surface. This is especially noticeable when sitting close to the observed eye, where variations can be more easily noted. With the mirror half a meter in front of the patient, and the light too obliquely placed, there will be practically no illumination of the patient's visual zone, since it will be occupied by the non- or almost non-reflecting area (according as to whether a Thorington or other plane mirror is used) in the sight-hole of the retinoscope. With the light close, and the maximum number of rays striking the mirror's surface as perpendicularly as possible, there is an almost uniform illumination, and to the beginner especially the brightness of the reflex is a matter of first importance.

A FURTHER REPORT ON HOLOCAÏN AS A LOCAL ANESTHETIC IN OPHTHALMIC WORK.*

BY H. V. WÜRDEMANN, M. D., AND NELSON M. BLACK, M. D.,

OF MILWAUKEE.

September 15, 1897, we reported[6] two months experience with the new local anesthetic, holocaïn, a synthetic alkaloid introduced by Tauber[3] derived from the p-Phenetidin series, which had been used for operations of all characters upon the eye and before electrical or irritating medical applications. Since the above report we have used this anesthetic several hundred times for various purposes and have studied its action in comparison with that of cocain and eucain.

Satisfactory local anesthesia may be obtained by any of these three, but on account of the severe irritation produced by eucain its use has been given up. Other recently brought forward chemical products will cause local anesthesia. The modification of eucain called eucain B. is vouched for by its introducer[5] to possess all the advantages and none of the irritant qualities of eucain. The latest candidate is anesin[4] which seems to afford less anesthesia than the others, although it is non-irritant. Eucain B. and anesin have not yet been tried in our practice.

Holocaïn possesses some practical advantages over cocain with which we more particularly wish to compare it. First, is the rapidity and completeness with which it produces anesthesia and the length of time which this condition obtains. Anesthesia of the cornea is produced in fifteen seconds after one application of one drop of a one per cent solution and lasts for ten minutes and upwards. For operation, however, upon the cornea it is advisable to drop in the solution at least three times at minute intervals when its anesthetic effect lasts about twenty minutes. On account of the rapidity of its action, no time is lost in producing anesthesia. One has to wait ten to twelve minutes for the beginning of full anesthesia by cocain. We have found that anesthesia of the cornea is quite as complete as that from cocain. Anesthesia of the iris is likewise produced, a factor which does not obtain in cocain anesthesia in cases where the tension of the eye is greatly increased, as in glaucoma. Anesthesia seems to be indefinitely prolonged by repetition of the solution;

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*Read before the Chicago Ophthalmological and Otological Society, December 14, 1897.

this is not the case with cocain. By one drop in the eye of the one per cent solution the feeling of irritation produced is about the same as that from five per cent cocain solution. There may be a slight disadvantage from the fact that the eye is somewhat congested by holocaïn, but we have no complaints therefrom. The congestion passes off within an hour.

Our operations for tenotomy and advancement under holocaïn have been quite as satisfactory as with cocain. We drop in the holocaïn solution at more frequent intervals in these muscle operations than has been our habit for cocain anesthesia, applying it five or more times during the course of the operation; after the conjunctiva has been opened dropping it in the wound, repeating after incision in the tendon has been effected. For advancement we have sometimes used a two per cent solution. The accommodation not being affected by holocaïn as by cocain perhaps allows of more exact measurement of the muscular imbalance during the stages of operation for heterophoria as the relation of accommodation to convergence is thus not disturbed.

We believe that absorption of the drug is more thorough than in the case of cocain, for after the first instillation of the latter the effect of its action in constricting the blood vessels renders absorption less. Thus the deeper structures such as the iris are more thoroughly anesthetized by simple dropping of the solution upon the cornea. However, in muscle operations and in pterygia the tendency to more free hemorrhage under holocaïn, which is certainly disadvantageous on account of impeding the operator's view, also seems to diminish the anesthesia, but by frequent use of the holocaïn solution as above noted, the anesthesia is readily maintained. The duration of the full anesthesia produced by holocaïn is a little longer than that from cocain, being about ten minutes for the latter and about doubled by the former. Absorption by inflamed surfaces such as the inflamed conjunctiva of granular conjunctivitis and in glaucoma seems more ready than in the case of cocain.

The cornea does not desiccate and is always moist with holocaïn, eucain and eucain B., due to vasomotor dilatation and the transudation thereby produced. The danger of epithelial desquamation from drying of the cornea under cocain is not to be disregarded and in some cases the vaso-motor constriction must certainly unfavorably influence the nutrition of the tissues and the course of healing. Necrosis has been reported a number of times after hypodermatic injection of cocain solutions. By this reason cocain is contraindicated in ulcer of the cornea for the relief of pain. Holocaïn or the two eucains, however, are useful not only on account of their anesthetic qualities, but they are likewise antiseptic and their effect upon the blood vessels seems to stimulate the healing process.

Neither the pupil nor accommodation are affected by holocaïn which renders it especially useful before applying irritating medicines or removal of small foreign bodies, as no unpleasant blurring of vision or dilatation of the pupil, as produced by cocain, is noticed. The intraocular tension is not increased.

The stability and bactericidal qualities of holocaïn solutions are of minor importance but are valuable. The solutions are not only sterile but are antiseptic. They are not affected by boiling in porcelain.

There has been a decided rise in prices since the new tariff has gone into effect. The following are those current in Merck's report of December 1, 1897:

Cocain hydrochlorat	$3.50	per	oz.	(used	in	five	per	cent	sol.)
Cocain alkaloid	4.55	"	"	"	"	"	"	"	"
Eucain	3.50	"	"	"	"	"	"	"	"
Eucain B.	3.50	"	"	"	"	"	"	"	"
Holocaïn	12.80	"	"	"	"	one	"	"	"

Although by the ounce holocaïn is at present the most expensive, yet when it is considered that one ounce goes five times as far as an ounce of any of the other drugs, the comparative price would be $2.56, much less than the others. In these commercial days this may be a factor of considerable importance in popularizing its use. The laws of supply and demand will tend to reduce the price of holocaïn should it prove as useful as it now promises.

We have used it for local anesthesia in the following cases:

Six cataract (simple) extractions.
Three cataract extractions with iridectomies.
Four cataract discissions.
An opening of pupillary membrane with keratome and scissors.
One removal of traumatic cataract and of steel in lens by magnet and incision.
Six iridectomies.
Eleven tenotomies.
Three tenotomies with advancement.
Six canaliculotomies.
Six chalazia.
One sarcoma of conjunctival limbus.
One pterygium.
One curettement of corneal ulcer.
Two cauterizations of corneal ulcer.
A number of foreign bodies in conjunctiva and cornea.
As an instillation before use of irritating medicines such as

silver, blue stone, alum, iodin, etc., and direct application of electrode to corneal and conjunctival surfaces.

Other operations have been done under cocain anesthesia. In one case where extraction of cataract was done on both eyes at separate times, holocaïn was used for the first eye and cocain for the second. It happened that during the second operation the patient complained of pain and afterwards suffered from extensive prolapse of the iris. This, however, is certainly not to be ascribed to the cocain. In several operations for squint one eye was operated upon under holocaïn anesthesia and the other under cocain anesthesia. A large number of contrast experiments were made before the application of irritating medicines.

The anesthetic qualities of holocaïn are equal to those of cocain and it is no more irritant. Holocaïn excels cocain for operations upon the bulb in the following:

Its action is quicker and more lasting.
It more thoroughly anesthetizes the iris and deeper structures.
It more thoroughly anesthetizes inflamed surfaces.
The anesthesia may be indefinitely prolonged.
The cornea does not desiccate under its use.
It does not affect the tension.
It does not act on the pupil or accommodation.
It does not interfere with the nutrition of the tissues but rather increases their blood supply and hastens healing.
Its solutions are antiseptic.
It is already proportionately cheaper.

The only disadvantage in the substitution of holocaïn for cocain for anesthetic purposes is that bleeding is more free under holocaïn, but the resulting blood clot, for instance in muscle operations, is no greater and is as speedily absorbed. Cocain is likewise a cycloplegic and mydriatic and its power to diminish congestion has a distinct therapeutic indication.

Although holocaïn has been found by us to possess these distinct advantages over cocain when applied as a pure anesthetic, it has not and probably will not entirely displace the older medicament. We are not enthusiastic over its effect, but have made a rather extensive trial of the drug in an attempt to prove the claims of Tauber and others who have recently filled the pages of the European medical press with the results of their investigations. Only one author[1] ascribes any ill effect to its use, and his conclusions may be received with doubt. Hotz[2] has observed that penetration is not as deep but he has only experimented with a single solution of one per cent strength. In our practice no toxic effects have been observed from holocaïn, and indeed although we have also used many ounces of cocain during the past dozen years we have seldom seen any effect upon the system and believe that both those drugs are safe when properly used.

128 Wisconsin St.

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THREE FACTS AND TWO THEORIES AS TO THE LAW OF DIRECTION.

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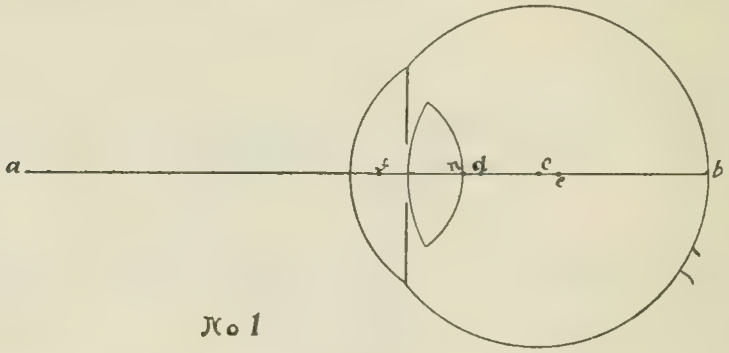
Illustrated.

The law determining the direction of things seen is as old as the first eye created, and is as unalterable as are any of the natural laws governing the universe. Prior to, and even far within, the present century all the phenomena of vision were vaguely understood, and most of them were relegated to the then dark domain of psychology. It was taught that ideas of direction were only the result of experience acquired in infancy and childhood; and there was much speculation as to whether a little child saw objects erect or inverted. Notwithstanding ignorance of the law, the perfect eyes of men and beasts and birds saw things in their proper direction in space, in obedience to the law. All natural laws were instituted by divinity in the beginning, and whether man has known about them or not, they have been continuously in operation. Before Newton discovered the law of gravitation, bodies above the surface of the earth, heavier than the atmosphere, having lost their support, were drawn toward its center. The falling of the apple was the fact that led Newton to evolve his theory of gravitation, which will stand for all time, supported by many facts and opposed by none.

There are now two theories touching the law of direction. Although the two do not very widely differ, one must be false. If each is unsupported by facts, neither can be true, and another would have to be evolved. These theories are, in order of age, first: "Every line of direction is an axial ray of a cone of light, these all crossing at the nodal point of the eye" (Helmholtz); second, "Every line of direction is a radius of retinal curvature prolonged" (Savage). The three facts refuting the one theory and establishing the other, are: first, the temporal field of vision is 90°, in some cases more; second, objects not on the visual axis are not always where they seem to be; third, the character of the image of a house, taken at an angle of 45°, as shown by photography, contrasted with the real appearance of the house as seen by the eye.

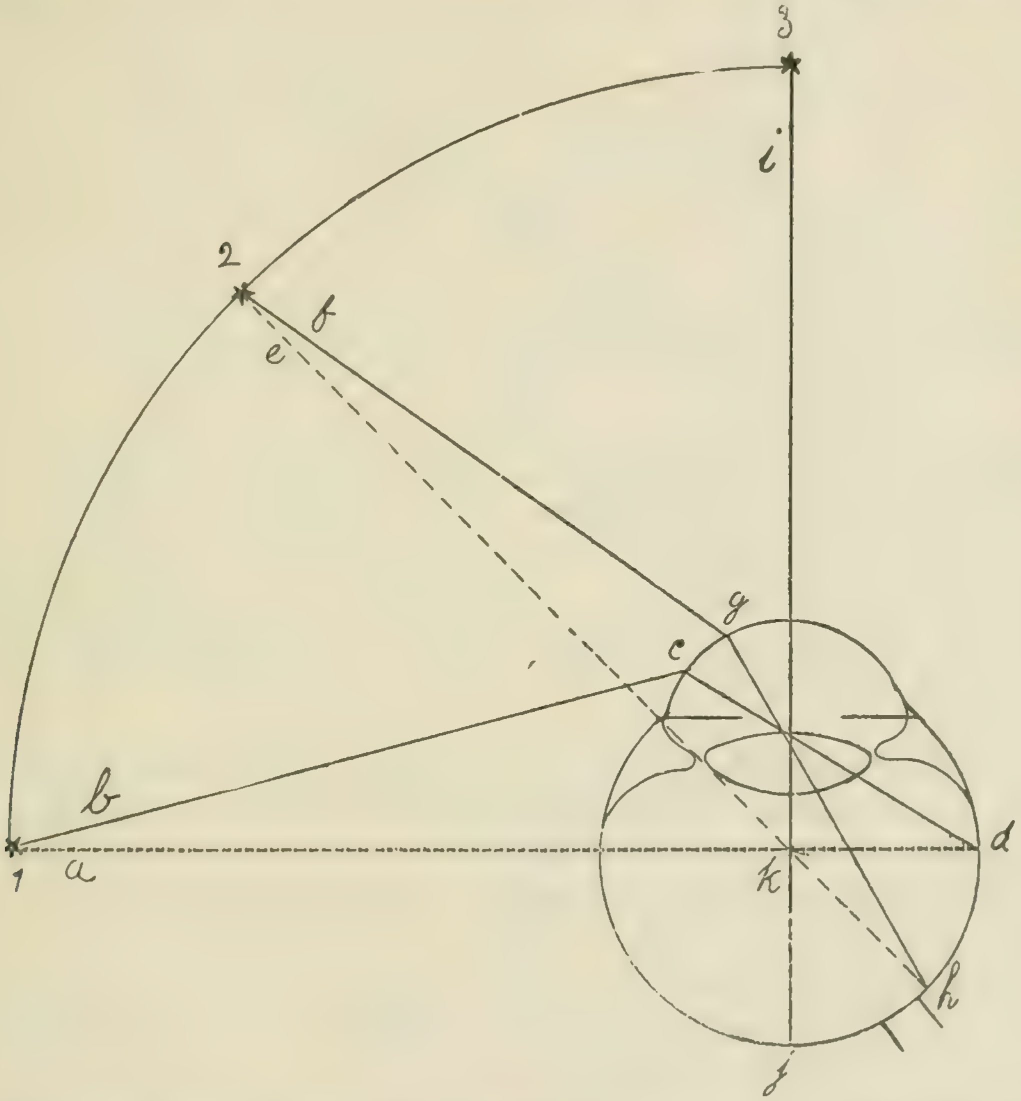
The accompanying diagrams are necessary for a clear presentation of these facts. Diagram 1 is approximately a correct representation of the perfect human eye. It shows the refractive media, the iris with its pupillary opening, and the visual axis (*a-b*), on which is located the centers of all the curvatures of the eye. At *c* we have the center of retinal curvature; at *d* the center of corneal curvature; at *e* the center of curvature of the anterior surface of the lens, and at *f* the center of curvature of the posterior lens surface. The nodal point is also on this line, and is situated in advance of the center of corneal curvature at *n*, in the posterior part of the lens. This line, the visual axis in the perfect eye, begins at the macula, *b*, the most acute part of the retina, and, passing through the centers of all curvatures, must be coincident with a radius of curvature of each. The object seen most acutely must be on this line; and it is clear that the axial ray of light from the fixed point of this object passes into the eye and reaches the retina without refraction anywhere. Either the nodal point is wrongly located or all other axial rays must fall to the outer side of the radii of curvature for all other corneal points, and therefore must undergo refraction; and the bend must always be such



No 1

as to make each of these rays cross the visual axis anterior to the center of corneal curvature.

Diagram two shows that it is not true that all these rays cross the line of vision at the nodal point. The axial rays, from objects in space, located near the visual axis, do cross it at the nodal point, but those from objects further out in the field of vision cross the axis in advance of the nodal point, and the further removed the object, the more advanced is the point of crossing. This diagram represents a spacial curve, 1–2–3, which has a common center with the retinal curve, *d–h–j*. Three objects are on this spacial curve, one immediately in front of the eye, one at 45° and the other at 90°. The axial ray, *i–j*, from the point 3, is unrefracted in its course to the retina; the ray, *f–g*, from the next object is refracted, and crosses the visual axis well within the lens, and the ray, *b–c*, from the



object at 90° is so refracted that it crosses the axis of vision still nearer the anterior surface of the lens.* Thus it is clear that the axial rays do not cross the visual axis at a common point; and this, of itself, goes far towards disproving the theory that claims axial rays as lines of direction.

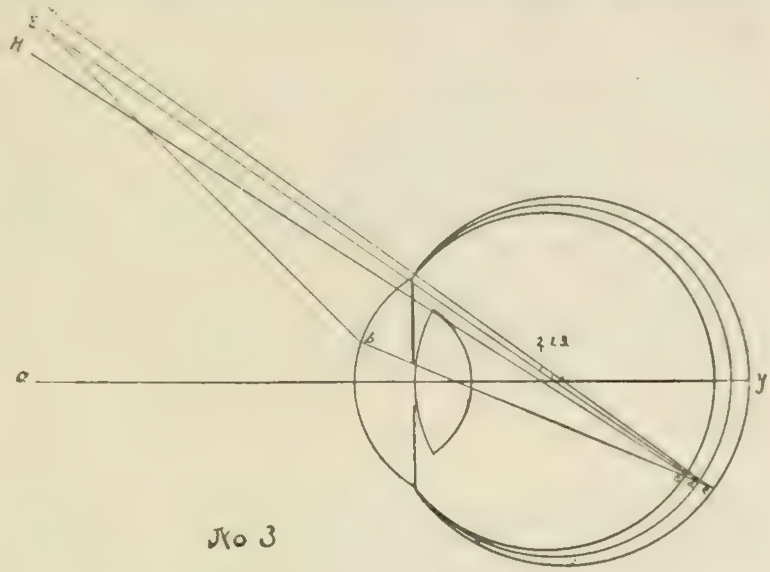
Again, diagram 2 will help in the presentation of the fact that the temporal field of vision is 90°, and in some cases fully 100°. Everything seen must send light into the eye through the pupillary opening, and this light must make its impress on some part of the retina. The retinal excitation thus effected must be carried to the brain by means of optic nerve fibres. At once the mind sees the source of the light in some direction in space, in obedience to a law. The source of the light and the point of the retina excited can be connected by a straight line, and that line must be the line of direction. The spacial curve and the retinal curve being concentric circles, point for point can be connected only by a line that passes through the common center, *k*, and that line must be a radius of retinal curvature prolonged. An object at 90° to the visual axis cannot send light into the eye coincident with this line, for it passes through opaque structures on its way out. The light coming from the object at 1 must go to the cornea, be there refracted so as to enter the pupil and then pass on to the retina. If the part of this axial ray within the eye is to be a part of the line of direction, it must be prolonged from the cornea out into space, and on it the source of light must appear to be. The object, although actually at 90° with the visual axis, would appear to be at 60°.

The axial-ray theory of direction comes in deadly conflict with the fact that the temporal field of vision is 90°. The retinal-radius theory is confirmed by this fact, for the line, *d–a*, connecting image and object, is a radius of retinal curvature prolonged, and the object is, in reality, where it appears to be.

The second fact disproving the one theory and confirming the other, is: objects not on the visual axis, *ay*, (Fig. 3) are not always where they seem to be. Perfect eyes always see all objects in the correct direction; hyperopic eyes always see objects, not situated on the visual axis, between the real object and this axis; myopic eyes always see objects, not on the visual axis, to the outer side of the position occupied by the real object (Dunn). The emmetrope, the hyperope, and the myope all see the object whose image is on the macula in its proper direction in space. A representative of each of these classes, placed by a black-board, but within easy reach of it, and his visual axis parallel with the board, would see a dot, made

*For clearness, the refraction is represented as taking place only at the corneal surface.

approximately at an angle of 45°, in a definite direction. If the emmetrope is given a piece of chalk and is asked to quickly make a mark through the dot E his stroke will come down through it; the hyperope's stroke would miss it in front at H; the myope's stroke would fall behind it at M. If the axial-ray theory is correct no one could see objects, not on the



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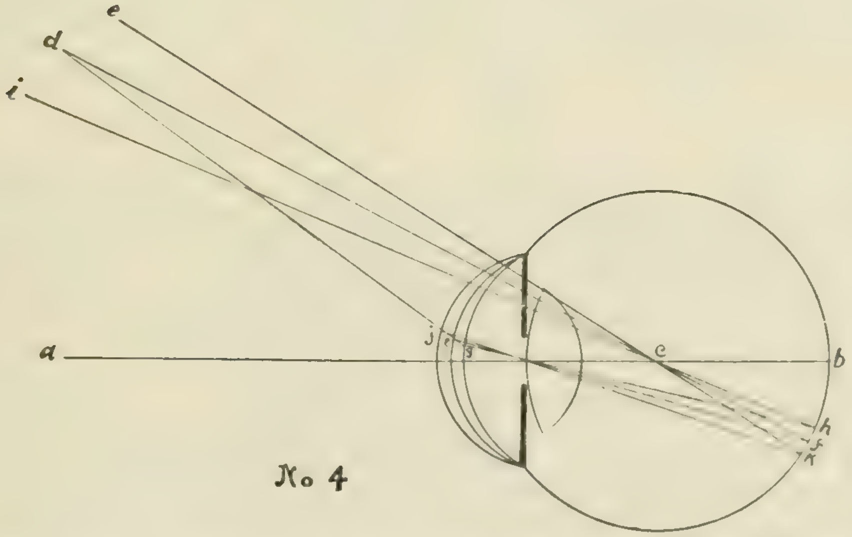

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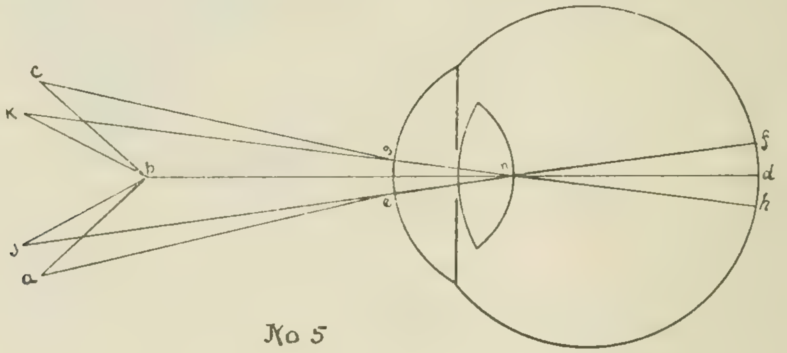
visual axis, in the right direction; but all would see them displaced towards the visual axis. The facts illustrated in diagram 3 prove the retinal-radius theory to be true, and the axial-ray theory false. Diagram 3 represents the two visual errors as axial, while diagram 4 represents them as refractive; but in either case the same truth is made manifest.

The third fact is illustrated in diagrams 5 and 6. A photograph of a house, taken at an angle of 45°, clearly shows the front and the exposed side so related as to form an acute angle. Why this right angle appears as an acute angle can be easily explained by means of diagram 5. To the human eye, related to the building just as the camera was, no such distortion would occur, and yet the image on the retina would be like the image on the sensitive plate of the camera. To the perfect eye the corner would be a rectangle; to the far-sighted eye, for the reason already given, the angle would be a little less than a right angle; while to the near-sighted eye it would appear to be a little more than a right angle. Diagram 6 offers a full explanation for the fact that a perfect eye, looking at a building at an angle of 45°, will see the two walls united at a right angle. In diagram 5, the figure *abc*, a right angle, is intended to represent the corner of a house immediately in front of the eye. The ray of light from the corner, *b*, enters the eye and passes on to the retina at *d*



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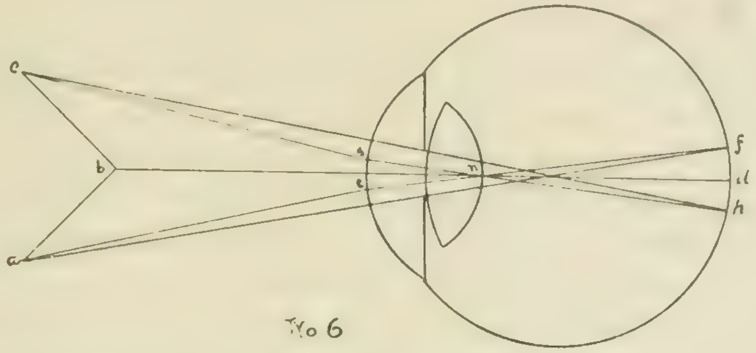
unrefracted; the ray of light from *a* strikes the cornea at *e* and is bent from its course and passes on to the retina at *f;* likewise the ray of light from *c* strikes the cornea at *g* in such relation to the corneal radius at that point as to make a change of its course necessary, and then it proceeds to the retina at *h*. If the axial-ray theory is true the line of direction would pass from *d* out through the nodal point, *n*, to *b*, whence came the ray *bd;* from *f* the line of direction would pass through the nodal point *n* to *e*, from which it would have to be prolonged to *j;* from *h* the line of direction would pass through the nodal point *n* to *g*, from which point it would have to be prolonged to *k*. The lines, *jb* and *kb*, show that the right angle *abc*, would appear to the eye as an acute angle, *jbk*, just as a photograph would represent the building. The eye does not see it that way, hence the axial-ray theory cannot be true.

Diagram 6 is an eye looking at the figure *abc*, intended to represent the corner of a house. The axial rays of light, *bd*, *aef*, and *cgh*, behave precisely as is shown in diagram five. According to the retinal-radius theory the point *d* of the retina will project through the center of retinal curvature out to *b*, being everywhere coincident with the unbroken axial ray; the point *f* will project through the center of retinal curvature, *r* to *a*, the exact source of the ray *acf;* the retinal point, *h*, will project through the center of retinal curvature, *r*, out to *c*, the exact source of the axial ray *cgh*. The eye sees the object as it is, hence the retinal-radius theory must be true.



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These three facts unite in destroying the theory that "all lines of direction are axial rays prolonged, and that these lines all cross at the nodal point in the posterior part of the lens." This trinity of facts furnishes a firm foundation for that theory of projection which says: "All lines of direction are radii of retinal curvature prolonged."

ON SOME CHANGES IN VISUAL SENSATIONS AFTER CATARACT EXTRACTION AND ESPECIALLY BLUE-VISION (KYANOPSIA).

BY SWAN M. BURNETT, M. D., PH. D.

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When the perceptive elements of the organ of vision, which have been acted upon for months or years only by the light which has drifted through a semi-opaque lens and the tissues of the ocular walls, are suddenly exposed to the stimulus of ordinary white light, it is to be expected that some modification of visual sensation would be experienced. It is rather remarkable, therefore, that we find so scant mention of any such phenomena in our text-books and treatises. With the exception of some cases of red-vision (erythropsia) the matter seems to have been passed over in almost total silence. In twenty-two text-books in English, French and German at my command I find a reference to these manifestations, other than erythropsia, in only two, and those phenomena mentioned are not of the same kind. One reason, no doubt, why the matter has received no closer attention is that the surgeon is so engrossed, at the time, with the one idea of a successful outcome for his operation as to useful vision, that other less significant and important questions are not considered or deemed worthy of record. On the other hand, the patient, thinking that some changes in customary visual sensations are to be expected as a matter of course, is also not likely to mention any such modifications unless they are very pronounced or long continued.

For a number of years I have, from time to time, observed cases where the phenomena to be hereafter described have been of sufficient intensity to cause the patient to bring them to my notice and many others in which my own questioning has established their existence. I am induced to direct the attention of the profession to them now in the hope that other observers may be induced to record occurrences in the same line, for I am sure my experience has not been exceptional and that every operator of any considerable experience must have met with similar cases.

A very common complaint of patients from whom a cataract of some months standing has been removed, is of a glaring white haze over all objects. Colors are almost abolished or are seen only dimly, and not in their true values. Arlt is the only author I have found who mentions this. " On first going out, which is usually in the evening, the patient observes that all objects appear as if covered with snow." (*Krankheit. d. Auges.* Prag. 1851. p. 321.) In some cases this whitish look has persisted for a week, or even longer in two instances. To sensitive people it is very annoying, and is likely to make them apprehensive lest their vision should not return to its former normal condition. I presume the advocates of the Hering theory of vision would account for this on the supposition that the black-white element of the retina suddenly coming into activity, after having been dormant for so long, overpower the color elements and drown them with their increased vigor. It is hardly necessary, however, to accept a distinct set of organs for the perception of white (the black-white substance of Hering) in order to have this sensation of glare after a long seclusion of the retina from white light. The normal eye experiences the same kind of sensation, though in a less degree, when exposed suddenly to an intense flood of white light. We all know, from experience, that under a very strong illumination it takes time to work out the finer shades of color which are overcome by the totality of light sensation we call white. We should expect a great intensification of this in a retina excluded for many months or may be years, from the normal stimulus of all the light waves constituting white. This is further aided, in the case of cataract extraction, by the existence usually of a large pupil, from mydriasis or from an artificial coloboma. Even in the most pronounced cases, however, this phenomenon subsides in the course of a few weeks, and the natural and customary value of colors and white light is restored.

Instances of *red-vision* (erythropsia) are much less common. Quite a number, however, have been observed in cataract cases, and besides it is a phenomenon which is met with in the normal eye under certain conditions of exposure to very intense light for a considerable time, as observed in those traveling through the Alps in winter, and in the arctic regions. This has enlisted the interest of several careful students, among the latest of whom are Fuchs (*Archiv. f. Oph. B. XLII. Ab. 4.*) and Snellen (*Archiv. f. Oph. B. XLIV. Ab. 1.*). Fuchs thinks the phenomenon of red-vision due to the action of the strong light on the visual purple, and its regeneration slowly under a less intense light. There are many arguments against this, the principal one being the absence of visual purple at the macula lutea. One suggestion of Snellen is important and has much significance in our attempts to explain the phenomenon, and that is the color of the light which passes through the lids and choroid and is diffused over the retina. This in a very strong light is reddish, on account of the vascularity of the tissues through which it has passed. One has only to look towards the sun with the lids closed in order to verify this. The whole field of illumination is then of a bright red hue which is sometimes very intense. Snellen's theory, as applied to cataract extraction cases, is that under exposure to a strong white light the lids are pinched close together, leaving only a small passage for the light through the center of the pupil. While, therefore, the light entering between the lids is white, that passing through the lids is red, and the periphery of the retina is flooded with this reddish light. During exposure to a strong light nothing special is noted, but when the eyes are brought into a light of medium or low intensity, as in an ordinary room, the red perception at the periphery gives place, under fatigue, to a sensation of green (the complementary color of red) while the impression at the center appears red by contrast. This is certainly very plausible and accounts for the phenomenon in a strictly scientific manner. As, however, the conditions surrounding cataract patients are always practically the same, and instances of erythropsia are uncommon, we must infer that the personal equation—probably in the form of an unusual impressionability—is an important factor in this, as in many other analogous phenomena of abnormal sensations.

Erythropsia is not, however, the only form of color vision which is liable to affect patients from whom a cataract has been removed. I have quite frequently noted that such patients remark on the *blue* color which pertain to all illuminated objects; and since my attention has been more directly given to the subject, I find but few who, at least immediately after the extraction, do not notice this bluish tinge in a greater or less degree. A number of times I have had patients, as soon as the lens was delivered and the pupillary space cleansed, exclaim—" How blue everything looks." Occasionally this bluish tint remains for a considerable time, as in a case now under observation for extraction of the cataract in the other eye. The patient is a colored man who had well-matured rather brown cataracts in both eyes. Objects were " as blue as indigo " he said, when the eye was dressed for the first time. Even now, some three months after the extraction, the electric lights appear to that eye as deep blue bags. After the operation on the second eye, which he has just undergone, the blue tinge is much less intense than it was in the first eye, and does not bother him at all. In one other case, that of a white woman, there was a recurrence of the blue-vision three times during a convalescence of three weeks, each attack lasting an hour or so. The exact circumstance attending these recurrences I was not able to learn of.

My attention was first strongly attracted to this phenomenon of kyanopsia some years ago by a highly intelligent and cultivated woman whose cataracts had matured very slowly and were of a uniform, deep, rich amber tint, without any striæ. Even at the time of the operation she could see sufficiently well to get about alone in her own house, showing that a quite considerable amount of light found its way through the sclerosed lenses. There was a small coloboma as a result of prolapse of the iris. As soon as the eye was exposed to the light she complained very much of the blueness of all illuminated objects; and it was several weeks before there was a return to the normal color-values in that eye. Without doubt the contrast between the vision in the operated eye and the remaining vision in the other eye in which all objects partaking of the color of the brown lens were more or less yellow, was a most important factor in this case in bringing out strongly the blue color.

In but one text-book or treatise on diseases of the eye have I been able to find a reference to kyanopsia following cataract extraction. This is in Becker's article on the Lens, in the *Gräfe und Sämisch Hand-Buch.* B. V. On pages 465 and 466 he says " Immediately after the expulsion of the lens the patient frequently sees everything, as the fingers held before it, not in their natural colors, but blue. This has been attributed to the operation of contrast, since the color perception of such patients must be affected by the intensely yellow color of the nucleus. If this were true the phenomenon should disappear a short time after the expulsion of the lens, and should not be present in the case of white cataracts which do not have a yellow nucleus. Neither is the case however, and it can be more readily explained by the corticalis and thin layer of blood remaining in the anterior chamber. The blue-vision vanishes as soon as the remains of the corticalis are removed."

It is difficult to reconcile this opinion of Becker with all the facts or with the physics involved. In none of my cases was there any blood in the anterior chamber, the extractions being done according to the simple method, and the phenomenon persisted sometimes long after all remaining corticalis had disappeared. He fails, furthermore to tell us how corticalis or blood could give us blue-vision either by directly transmitted light or by contrast. I have not observed kyanopsia except in cases where the lens was of a more or less amber color, and the blue appearance is easily accounted for by the fatigue of the retina from long continued exposure to the yellow light, giving blue as a residual sensation in white light. In some cases this fatigue is readily recovered from, while in others it persists for a longer period and may recur from time to time under the operation of a more intense light, or some temporary alteration in the perceptive apparatus.

Kyanopsia: (*Κυαγεος*—blue, *οφις*—vision) is not a very common phenomenon under any circumstances, but it is of sufficiently frequent occurrence both in practice and in our literature to warrant, one would think, a place for it in the medical dictionaries, and yet a search through the most important dictionaries in English, French, and Italian has failed to discover the word in its proper form in any of them. In only two, both American, did I find any reference to blue-vision and this was under the erroneous spelling of *cyanopia*.

AN IMPROVED FORM OF STEREOSCOPE.

BY CHARLES A. OLIVER, A. M., M. D.

One of the Attending Surgeons to Wills' Eye Hospital; One of the Ophthalmic Surgeons to the Philadelphia Hospital; Member of the American and the French Ophthalmological Societies.

Illustrated.

Several years ago, whilst almost daily realizing the growing importance and at times absolute necessity of possessing some form of stereoscopic mechanism by which I could obtain adequate data both as to diagnosis and therapy in the various forms of extra-ocular muscle disturbance, and simulated blindness, I determined after the employment of the several instruments then at hand (the best of which was Javal's) to construct one which, whilst simple and uncomplicated, would fulfill all of the conditions that might be necessary to determine in any given case.

In December, 1894, after many trials and as the result of several modifications, the form of instrumentation shown in the accompanying cut was obtained and exhibited before the Section on Ophthalmology of the College of Physicians of Philadelphia.

In addition to the main features of the ordinary instruments, this contrivance possesses the following advantages:

I. A heavily weighted base, thus insuring stability.

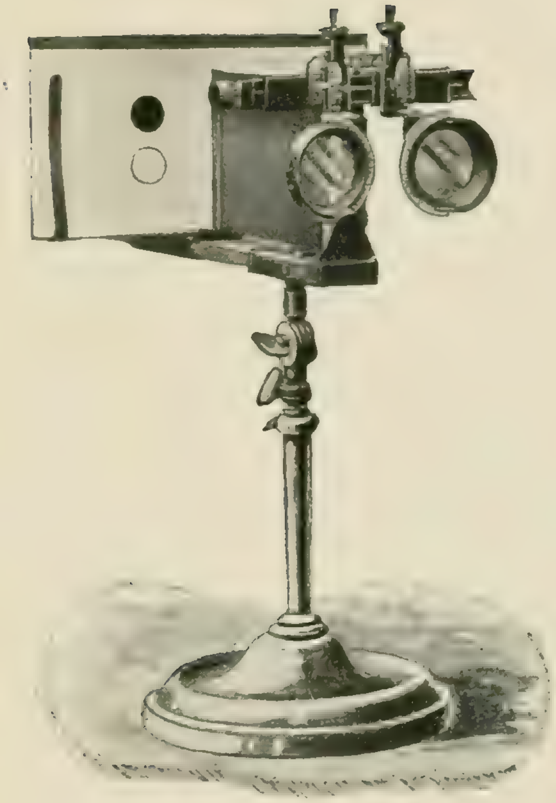
II. Three sliding vertical tubes each containing a set screw, by which any desired adjustment for height, rotation, and inclination can be obtained.

III. Sphero-prismatic eye-pieces held in separated cells, each of which is graduated in the same manner as trial frames, and having extra semi-circular grooves for carrying additional lenses and prisms.

IV. Each eye-piece so swung into a groove as to permit independent circular rotation in any meridian desired.

V. An inter-pupillary mechanism by which an exact measure and an absolutely correct position between the optical centers of the two eye-pieces or any combination of eye-pieces and the pupillary centers can be obtained for any desired point of monocular or binocular fixation.

VI. An adjusting arrangement by which any degree of vertical difference between the pupillary centers of the two eyes can be gotten, registered and made to coincide with the optical centers of the eye-piece combinations.



Dr. C. A. Oliver's Stereoscope.

VII. A sliding and self-regulating upright divisional wall between the two planes of vision, thus separating the two fields of vision except for any desired position, and thus avoiding any uncertainty as to result.

VIII. Focussing-rod marked in both fractional differences of inches and in millimeters; by which the exact position of the test objects can be registered.

IX. Test-holder adjustable to any point that the lenticulo-prismatic combination used may indicate for the test objects.

X. Test-holder, either removable from fields of vision or so regulated in inclination as to hold the test objects at any desired angle down and out from the vertical to the horizontal position.

XI. An improved series of well-executed and carefully adapted cards (including sliding plates, as in Perlia's series of Kroll's plates for orthoptic exercise,) accompanying each instrument.

Unless specially ordered for other working points, the form of instrumentation made and sent by the makers will be one adapted to ordinary office exercise, etc. This makes use of a pair of five degree prisms combined with a pair of four diopter convex spherical lenses; a pair of openings in the test-holder or a contrivance for the dropping of the test-holder out of position, thus permitting the use of the instrument when studies at greater distances out to infinity are desired to be made.

Messrs. Wall and Ochs, of 1702 Chestnut St., Philadelphia, Pa., U. S. A., have kindly undertaken the manufacture of the instrument. From them either the ordinary standard form of the instrument or any special modification can be obtained.

ERRATUM:—In Dr. Gifford's article on Epithelial Lip-Flaps, etc., in the December issue, the references to "Van Milligan" should have been to Van Millingen.

WOLFF'S OPERATIONS FOR CONGENITAL PTOSIS—A REPORT.

BY F. C. HOTZ, M. D.,

OF CHICAGO.

Illustrated.

The most noteworthy contribution to the surgery of the eyelids during the past year is undoubtedly Dr. Hugo Wolff's (Berlin) paper* on two new operations for congenital ptosis, in which the principle of advancement by tendon resection is successfully applied to the levator muscle. Attempts at advancing this muscle have been made by Von Graefe and Bowman, but with so little success that they abandoned the operation.

Eversbusch took the matter up again, and introduced the advancement by folding the tendon upon itself on the plan of de Wecker's advancement of Tenon's capsule, and in 1883 Snellen published his operation consisting in excising a portion of the tendon above the upper tarsal border, and re-attaching the tendon to this border. This operation, as Snellen remarked in his report, is "greatly embarrassed by the protrusion of the orbital tissue."

Dr. Wolff now shows us a far better and more effectual way of advancing the levator muscle. His operations appear very rational, and are the results of a careful study of the anatomy of the levator tendon.† If after removing the roof of the orbit we lay bare the levator muscle and follow its course to the eyelid we find its sheath firmly united with the tarso-orbital fascia about 8 m.m. above the upper border of the tarsus. This union of the fascia and muscle serves a physiological purpose; the fascia acts as a check ligament, for when the contracting levator draws the lid back, the fascia is also drawn back, but soon becomes stretched and opposes the further backward movement, thus keeping the retraction of the eyelid within certain limits.

After this line of union (dd. Fig. 1) fascia and muscle sheath are intimately blended, forming a firm aponeurosis, which, passing over the upper border of the tarsus is attached to its anterior surface in a line (c) about 5 m.m. above the lid margin. This aponeurosis can easily be separated from the tarsus with which it is connected by loose cellular tissue. When this aponeurosis is cut off at the line of insertion and reflected upwards the real tendon (bb) of the levator is exposed, which is inserted along the upper tarsal border. Directly under the tendon is the retro-tarsal conjunctiva, both being connected by a layer of cellular tissue.

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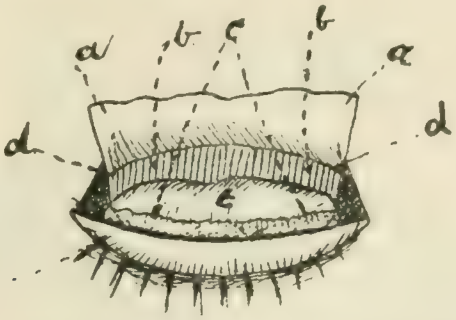
* Published in the German edition of the *Archives of Ophthalmology*.

† During the past two years the writer occupied himself with the same question, and his experiments on the cadaver had led him to the same conclusions as Dr. Wolff.

Upon these anatomic relations of the levator muscle to the lid, Dr. Wolff has built his two operations for the relief of ptosis, and in several cases has had excellent results from both.

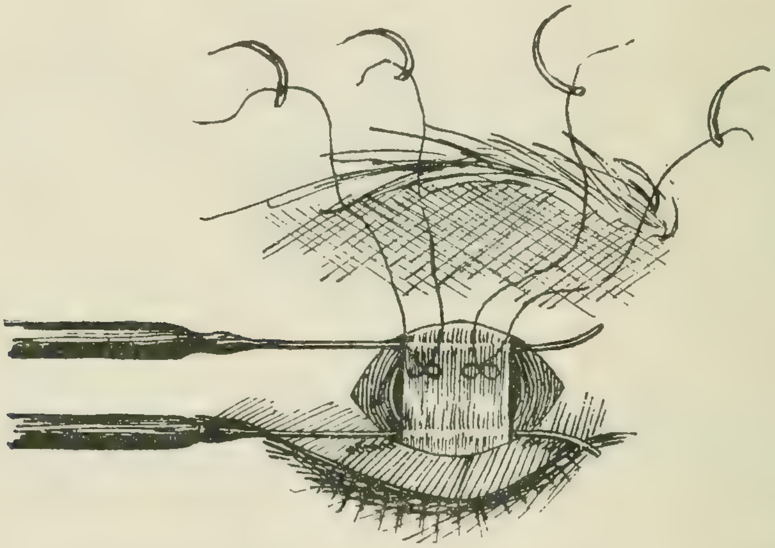


(Figure 1).

The aponeurosis, aa., cut off from its insertion, c, on the anterior surface of the tarsus, t, and reflected upwards to show the underlying tendon, bb, of the levator and the line of union, dd, between fascia and muscle sheath.

1. RESECTION OF THE LEVATOR APONEUROSIS THROUGH A CUTANEOUS INCISION.—A transverse incision is made through the lidskin along the upper tarsal border, and the skin is dissected upwards and downwards from the orbicularis muscle. Near the center of the upper border of the tarsus a portion of the orbicularis, about 1 cm. wide, together with the underlying aponeurosis is seized with forceps and lifted into a vertical fold. At either side of this fold a small vertical incision is made, through which two strabismus hooks are passed under the tendon. One of these hooks is placed near the line of insertion, while the other hook is pushed upwards to or even beyond the tarsal border, according to the length of the piece to be resected. This piece is measured off in millimeters, and two catgut sutures being put in at the requisite distance from the line of insertion, the tendon is cut off in front of the sutures. The two ends of each suture are then passed down behind the tendon stump and brought out through the line of insertion; they are tied and cut off short, and the skin wound is closed over them by four silk sutures which may be removed after five days.

2. Resection of the levator tendon through a conjunctival incision.—The upper lid being everted its upper border is seized with forceps and turned up. In this position the lid is held by a lid-clamp and a transverse incision is made through the retro-tarsal conjunctiva to expose the levator muscle. The middle portion of this muscle is then taken up by forceps, and a strabismus hook put under it near the tarsal border, while a second hook is put under it at the distance where the tendon is to be divided. At that place then two catgut sutures are put into the tendon, and after the latter is divided in front of them, both ends of each suture are passed through the tendon stump at the upper tarsal border, tied and cut short. The conjunctival wound may be closed by a suture, though it is not absolutely necessary.



(Figure 11.)

The first five days after these operations both eyes are kept closed by a bandage, which is to be changed twice every day. After the fifth day the bandage is left off, and if the lid of the operated eye is still swollen, cooling applications should be applied.

The success of these operations depends—as Dr. Wolff emphasizes—upon the accuracy of the resection; the resected piece of the tendon should measure exactly as many millimeters, as the vertical diameter of the palpebral aperture of the affected eye is smaller than that of the other eye.

SPONTANEOUS HEMORRHAGE INTO THE ORBIT

BY ARTHUR J. SHAW, M. D.,

OF BOSTON.

The patient, Mrs. B., I saw in consultation with Dr. A. D. Whitmore. The trouble started the last of February, 1897, ten days before I saw her. She was suddenly seized with severe pain about and in the orbit, the swelling came on rapidly, and caused much exophthalmus, and was soon accompanied by extensive extravasation of blood in the tissues of the lid and orbit.

Previous history—negative: Forty-seven years old—climateric one year ago. No abnormal condition was found by Dr. Whitmore. An examination made March 9—the first time I saw her—showed the left eye protruding one-half inch beyond the right, with a downward cast; cornea and conjunctiva were clear, with no inflammatory signs. The fundus showed a slight swelling of the disk, but there were no other changes, no stasis of the blood, etc. The pupil was dilated with atropin when I saw her. The treatment varied with the stage, and comprised: cold compresses, atropin, four per cent boracic acid solution, phenacetin, antipyrin, and later potassium iodide. March 13, the protrusion of the globe was slightly less, and motion of the globe was returning. May 3, I saw the patient at my office. Fundus was perfectly clear, and the protrusion of the eye was the same as on March 13, and the patient had single vision on looking directly ahead, and double vision looking in other directions.

V. O. D. $\frac{17}{20}$—1 sph. $v=\frac{17}{15}$
V. O. S. $\frac{17}{20}$—1 sph. $v=\frac{17}{15}$ + 1 sph. for near.

For treatment I ordered the above correction with a ground glass before the left eye.

To sum up, we have here a spontaneous hemorrhage into the orbit in a woman forty-seven years old, one year after the climateric. This is an extremely rare condition. Hemorrhages due to injury are, of course, very common, but the only like case I find reported, is one by Fiedenwald and Crawford, of Baltimore. Their case was that of a negro, in whom the condition appeared suddenly with greatly diminished vision; there was very little pain, and the absence of any inflammatory signs or bruit. Noyes in his text-book mentions this class of cases, saying they are very few, and the etiology so manifest, viz: Scorbutus, violent coughing, etc. This form of hemorrhage may, like that commonly due to injury, press upon the globe and nerve, and produce serious lesions, viz., optic atrophy, muscular paralysis, and other lesions may occur.

A NYSTAGMIC FAMILY.

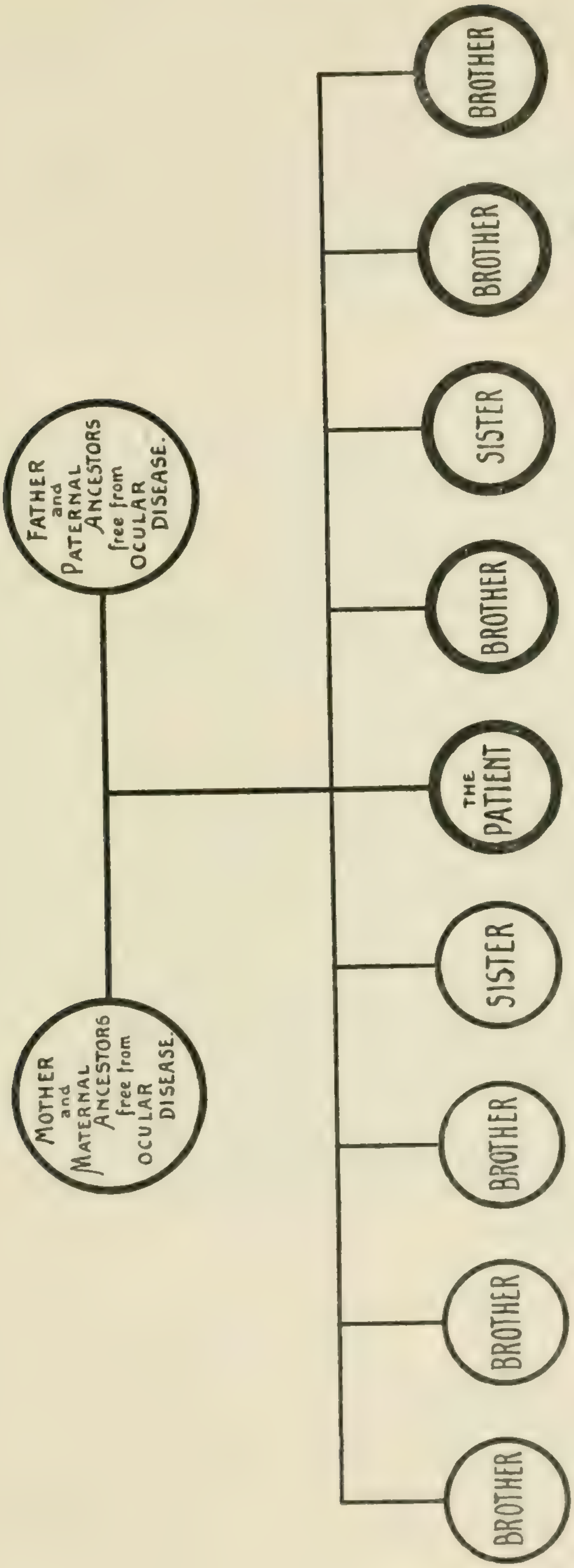
BY H. McI. MORTON, M. S., M. D.

MINNEAPOLIS, MINN.

Illustrated.

My excuse for exhuming the bones of a once much discussed, and yet undecided question—the cause of nystagmus—must be that the history of this family, which it is my pleasure to present, affords (together with cases reported by Casey Wood, Gould and others), interesting material for the study of the origin of this, as yet, obscure disease. From Wood's cases he infers the influence of the element of heredity, an inference not warranted from the cases presented by Gould or by my own. The abrupt change in the progeny (as is shown by the diagram) from a state of normal to one of abnormal ocular balance and its continuance, would lead one to suspect some embryonic changes, at that time, which influenced the embryo in a manner less subtle than we could properly designate as hereditary.

In all of the children the disease was congenital. In my judgment, those defects of the fundus, or of the focus, commonly assigned as *the causes* of nystagmus are not such, accurately speaking, but rather conditions, or predisposing causes, which influence the manifestation of the real cause, which may be, a malformation about, or improper correlation of, the oculo-motor centres occurring in the embryo. The embryonal defects may be so marked in many cases that the nystagmus manifests itself without the presence of trouble in either the refraction or fundus of the eyes. In this manner we could explain those cases of nystagmus in which we have little or no focal defect, and no lesions of the eye ground. Again, should the embryonal defect be slight and a tendency to nystagmus be present, but not in itself strong enough to give rise to it, those diseases of the fundus or anomalies acquired later in life, may act as predisposing causes to make manifest the central defect. The fact that in Albinos we have very commonly to deal with nystagmus is, it seems to me, consistent with this line of thought, since the irritation resulting from transcleral illumination, and the passage of light through the irides as well (due to insufficient pigment deposit), may not alone make manifest the nystagmus, but may point to some relationship between the


MOTHER and MATERNAL ANCESTORS free from OCULAR DISEASE.
FATHER and PATERNAL ANCESTORS free from OCULAR DISEASE.
BROTHER
BROTHER
BROTHER
SISTER
THE PATIENT
BROTHER
SISTER
BROTHER
BROTHER

failure of the epiblast to deposit pigment, and the embryonal defect. Inasmuch as we frequently have nystagmus in otherwise healthy eyes, and have, also, very frequently, eyes with serious intra-ocular disease and focal defects without the disease, it would hardly seem a warranted conclusion to assign affections of the bulb as a common, or a real cause of nystagmus. If it be true that abnormalities of the peripheral portion of the visual apparatus are, as some writers contend, such potent factors in the causation of nystagmus, in view of the great number of cases affected, should we not find more cases of nystagmus? I present the following history:

Mrs. J. J., aet. 43, white, consulted me April 4, 1895, relative to a rapid and continuous movement of the eyes. The only inconvenience suffered was poor vision, which had always been impaired, and without change. The irides are brown. There is no opacity of the media or disease of the lids or conjunctiva. The ophthalmometer indicates, in the right eye 1.00 D., axis 90°-180°, and left eye 1.25, axis 75°-165°. The ophthalmoscope shows 5.00 D. of myopia in each eye. Disks are both vertical ovals. Choroidal vessels are visible, and exudative choroiditis is present. No old cicatrix or pigmentation is present. She informs me that she is the fifth child in a family of nine children. *Of this family of nine children, the five youngest are afflicted with nystagmus in a marked degree.* The others have no ocular disease. Her parents are strong, robust, and free from ocular disease. They have traced back their ancestry on both sides of her family, and feel certain that no member had nystagmus or any serious eye disease. None of her brothers or sisters has ever worn glasses. In the four cases affected like herself, she informs me that none have opacities upon the eyes, and they all see better than she does, her vision being $\frac{6}{45}$, not improved by the correction of her myopia and astigmatism.

The most careful inquiry indicates the absence of syphilitic disease. Three uncles died of phthisis. Inspection of the case revealed that with the eyes to the extreme left, there is less movement than in the excursion to the extreme right, when the movements are exceedingly rapid and the excursions measuring about 3 mm. With the visual axes directed upward, slight movement is noticeable; when directed downward, *all* motion ceases. When looking ahead, the excursions measure about one mm., are rapid and from side to side only. There is no rotary motion. She has worn glasses for three years.

504 Dayton Building.

A CASE OF TRANSIENT PULSE OF THE RETINAL ARTERY INDUCED BY THE APPLICATION OF HOMATROPIN.*

BY GEO. C. HARLAN, M.D.,

OF PHILADELPHIA.

The following case seems to have some interest as illustrating in a very direct manner the effect of mydriatics in increasing intra-ocular tension and the danger of using them indiscriminately in patients of advanced age:

A negro man seventy-two years of age, well preserved and previously in excellent health, with the exception of occasional attacks of subacute articular rheumatism, had recently been under treatment in the Pennsylvania hospital for a severe attack of kerato-iritis, which seemed likely to destroy the left eye, but had finally yielded to treatment. There was an extensive corneal opacity and a posterior synechia at the lower margin of the pupil and vision was reduced to $\frac{16}{cc}$, but the eye was painless and free from inflammation. The fundus could not be seen. As there was only $\frac{15}{c}$ V. in the right eye and lenses failed to bring much improvement, homatropin instead of cocain, which would have been more prudent, was instilled for ophthalmoscopic examination and retinoscopy. The media were not quite clear, but a fair view of the fundus showed a decidedly pale disc but no cupping, a slight choroidal disturbance at the outer margin, some narrowing of retinal arteries, and a sound macula, a picture of partial atrophy. There was a very distinct pulsation of the lower temporal artery. The tension was recorded as doubtful +, but there was only a moderate peripheral contraction of the field. The anterior chamber was normal and the cornea was sensitive. Having seen arterial pulsation follow the use of homatropin in another case it occurred to me that this might be the cause and I dismissed the patient without treatment. At the next visit the pulse had entirely disappeared. Two weeks later, the vision had slightly improved, under strychnia. The pupil was responsive and of medium size, the external appearances were normal and there was no retinal pulse.

The other case referred to was reported in the *Transactions of the American Ophthalmological Society* in 1890.

The patient was sixty-six years of age. An energetic pulse of all the arteries on the disc was several times produced by homatropin and stopped by eserin. There was only a very shallow cup and no bending of the vessels at the margin.

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*Read before the Ophthalmological section of the College of Physicians, Philadelphia, November 16, 1897.

The field was normal. Tension + and there was no other indication of glaucoma but a slight congestion of the anterior ciliary veins. This patient, some months after the report of his case, had a well marked attack of glaucoma, of which the transient pulse may be considered the first decided symptom.

As the effects of homatropin are easily neutralized by eserin, might not its application be a permissible means of diagnosis in some doubtful cases? As my present patient is an employee of the hospital, we hope to have the opportunity of keeping him under observation and determining whether or not this transient pulse is, in his case, a symptom of impending glaucoma. He will be closely watched, and if any confirming symptoms arise an iridectomy will be advised.

According to most authors spontaneous arterial pulse scarcely ever occurs in the prodromal stages of glaucoma, and some consider it rare even in recent cases. de Wecker says that it is generally met with only when the attack occurs rather suddenly, and reaches a certain degree of intensity. I have, however, occasionally observed it in otherwise almost doubtful cases of chronic glaucoma. According to Schmidt-Rimpler the diagnosis of glaucoma may usually be made positively when arterial pulsation is found, and Berry thinks it is almost certain proof. I am accustomed to consider it in this light. Though it has been said to occur in other conditions, such as profound anemia and goitre, I have never met with it in a healthy eye except in cases of aortic insufficiency.

Whether we can exclude glaucoma when a pulse is not produced by the use of homatropin is another question.

To those ophthalmologists who keep a separate case book for registering the refraction and muscular condition of patients we would recommend the "Keystone Optometric Record." This is a neatly gotten up volume provided with blank spaces for recording all the necessary details connected with the prescribing of lenses. It is furnished with an index and ought to be of considerable value to refractionists.

Reproduction of a piece of wood, actual size, retained under the upper lid in the retrotarsal fold for a period of eight months.

FOREIGN BODY OF UNUSUAL SIZE RETAINED UNDER THE RETROTARSAL FOLD OF THE UPPER LID FOR A PERIOD OF EIGHT MONTHS.*

BY JNO. W. CROSKEY, M.D.
Attending Surgeon Wills' Eye Hospital, Philadelphia, Pa.

Illustrated.

H. J. presented himself at the clinic October 12, 1897, simply complaining of a "sore eye," and the following history was elicited:

While chopping wood eight months ago in Russia, a fragment of the wood flew off, striking him in the eye. As the eye caused him very little trouble no special attention was given it. Last March he left Russia to come to America, and as he crossed to Germany he was subjected to a physical examination; his vision was tried, and as this was good he was permitted to pass. He arrived in this country April 14th. The eye was still giving him a little trouble, but as it occasioned him no special inconvenience, medical aid was not sought. When he presented himself at the clinic the appearance of the eye indicated a purulent ophthalmia. Upon everting the upper lid there was found, resting securely in the retrotarsal fold, a piece of wood, as shown in the illustration, 18 mm. long, 6 mm. wide and 3 mm. thick, weighing, when the moisture had evaporated, one and a half grains. The upper lid was covered with a thick, tenacious membrane and at the inner angle was a mass of granular tissue 8 mm. in length, 7 mm. in width and 2 mm. in thickness. The entire upper lid was somewhat granular in appearance; the upper and inner quadrant of the cornea was slightly hazy, but the bulbar conjunctiva was free from any hyperemia. The piece of wood was removed, the granular tissue was excised and an astringent wash was given, which soon relieved the traumatic conjunctivitis.

The case is cited as one of particular interest; first, on account of the size of the foreign body; second, that it was allowed to remain under the lid for so long a time; and, third, the little damage to the cornea and adjacent tissues by its presence, a possible explanation of which lies in the fact that the piece of wood was macerated and softened by the lachrymal secretions.

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*Read before the Philadelphia County Medical Society, October 27, 1897.

THE

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A MONTHLY REVIEW OF THE PROGRESS
OPHTHALMOLOGY.

VOLUME VII. CHICAGO, JANUARY, 1898. No. 1. NEW SERIES

EDITORIALS.

REFRACTION WORK AS DONE IN HOSPITALS AND DISPENSARIES.

Patients come to us occasionally with the complaint that their glasses, prescribed at some hospital or dispensary, do not give the relief desired, and upon investigation we frequently find they are wearing spherical lenses when they really require cylinders or sphero-cylinders. These glasses have evidently been prescribed with very little care, and without the use of the cycloplegic — or with the idea that the patient is unable to pay for a cylindrical or compound lens, and that the less expensive spherical lens will give some relief by relaxing the accommodation. For the former there is no excuse, and the latter is mistaken kindness. If there is astigmatism the relief given by a spherical lens is doubtful, and if there is compound astigmatism, the cylindrical lens should be preferred to the spherical as the astigmatism is the more painful element. Both defects should, however, be corrected, for most opticians will sell glasses at half price, or less, to dispensary patients.

Indigent patients are especially dependent upon their eye-sight, and should receive the most careful attention. At some dispensaries, when a patient has better vision than $\frac{20}{30}$ no attention is paid to the refraction, and yet we know that many cases of very annoying astigmatism, or decided hypermetropia, have apparently normal vision. Such a patient may reject a +0.5D. lens, and under a cycloplegic, accept one twice as strong. Only the fact of frequent neglect of these matters induces me to insist upon it that when patients, especially sewing girls or school children, apply for treatment at a dispensary, with a history of headaches, painful eyes, or crusty lids, a most careful examination should be made under a cycloplegic, for errors of refraction; the proper lenses should be prescribed, and the patient sent to an optician who is as willing to do something for charity — just as the physician has done who made the examination. In regard to the kind of cycloplegic used, atropin is occasionally required for therapeutic reasons instead of homatropin, but in some dispensaries it is prescribed from motives of economy. Cannot these institutions better afford to use a few cents worth of homatropin than the average patient can afford to lose a week or more from work.

E. O. B.

THE OCULIST AS A WITNESS IN COURT.

The disagreeable and often thankless duty of testifying in court falls not infrequently to the lot of the ophthalmologist—and it is not always a happy one. The conditions taken into legal consideration are necessarily very varied, involving the morbid states of an organ said to be subject to more diseases than any other of the body, and moreover, the eye is so intimately connected with the nervous system, and so prone to disease from morbid conditions of the blood, that skilled and intelligent testimony upon these points goes far toward furthering the cause of justice in many cases of disease and injury.

As an instance, we may consider the actions sometimes brought by women for injuries which are alleged to have caused paralysis, etc. Such cases may present many conflicting features and puzzle the medical examiners to discriminate between hysteria or malingering on the one hand, and organic disease on the other. The condition and reaction of the pupils; the ocular reflexes; the condition of the eye-ground and of the vision, are here of importance. The instillation of a weak solution of homatropin in one eye by a litigious woman who feigned hemiplegia from a slight injury to the head, introduced an element of seeming probability, which was only excluded by a re-examination made unexpectedly, the pupil then responding to light and the fraud being exposed.

As in all cases of injury to any portion of the body, the examination of those of the eye must be minute, methodical, and exact. This is self evident. Nevertheless, when on the stand, the oculist has too often to regret that his notes are so superficial and inexact as not to bear the test of a cross examination, and that he has not by a study of the facts, formed an adequate or consistent conclusion, opinion, or theory of the case. The cultivation of the habit of close and accurate observation, of recording the ocular conditions and the constitutional states producing or modifying them, is the best safeguard.

Among the works which serve as guides and for reference in connection with court testimony, may be mentioned Turnbull's translation of von Arlt's "Injuries to the Eye," Gowers' "Medical Ophthalmoscopy," and Knies' "The Eye in General Diseases." But most valuable of all is a thorough knowledge of the physiology and physiological relations of the eye, especially as regards the nervous system. F. B. E.

COMMON SENSE VS. MUSCLE–CLIPPING.

Judging from a paper which has recently been presented to a medical society on this side of the Atlantic, the muscle tenotomy fad is about to "break out in a new spot," for the paper advances the theory that trachoma may be produced by an anomalous position of the horizontal plane of the eyes caused by a malformation of the skull.

The author thought that under these circumstances, the eyes being elevated and the nervous force of the eyelids and eye muscles pressing the eyes downward so as to see well below the horizontal plane, trachoma might be produced by lid pressure. *Of course*, according to the author, a well-assorted series of tenotomies and properly adjusted lenses will cure these cases. It is gratifying to note, however, that the tenotomy cure for trachoma receives but little, if any, encouragement, but it is to be feared that in this day of dramatic therapeusis, this theory, emanating from a high source, may find its disciples and that before long the journals will be full of minutely recited and accurately proven cases, showing beyond a peradventure that the old, threadbare tenotomy remedy is still accepted as a panacea, and is again equal to the emergency, and, that the scientist with his test tube and microscope, had better fold up his tents and like the ancient Arabians quietly vacate the premises.

Most progressive ophthalmologists, while regarding somewhat dubiously *graduated* tenotomy as an effective remedial agent, especially when it has to be performed on one person some ten or fifteen times, with the results still in doubt, are yet believers in a rational "tenotomology." But when the valiant knights, who wear this theory upon their breast-plates, wave aloft their bloody tenotomy scissors, and pathetically beg for more diseases to be produced that they may cure them, we feel that things have gone quite far enough, and that a vigorous protest should be entered against this form of professional hallucination. It may be news to the advocates of this theory to learn that the entire system of therapeusis is not embraced in this procedure, and that many ailments can be successfully treated from other standpoints! It may surprise them to learn that many eye diseases are frequently produced or aggravated by general disorders such as alimentary, hepatic uterine, spinal, and nervous diseases. It may be beyond their comprehension that eye and other diseases frequently recover *incidentally* during the course of treatment, without reflecting any real credit upon the medical attendant; in short, that diseases sometimes disappear *in spite of treatment.* And yet we venture to affirm these truths, with the unwavering belief that no rational criticisms will be made of them. If such assertions pass unchallenged, then the position of the constant muscle-clipper must be scientifically untenable, and he should endeavor to expand his mental field of vision, until he is capable of bringing pathological breadths within his cerebral scope. F. A.

THE Public Library of Cincinnati will hereafter refuse to issue books to persons living in houses where contagious diseases exist, and books being returned from such houses are to be disinfected and fumigated before being returned to the shelves of the library.—*Journal of the American Medical Association.*

FROM the *Philadelphia Medical Journal*, we learn that in the Vatican Library in Rome, there have been found, by Dr. J. M. Berger, a collection of ophthalmic prescriptions and directions for treating various diseases of the eyes, in the handwriting of Michael Angelo. As it is well known, that the sculptor and artist, was almost blind at the time of his death, they are not improbably intended for himself, and may possibly have been obtained from medical friends of his, or others whom he consulted, and then transcribed.

REPORTS OF SOCIETIES.

SECTION ON OPHTHALMOLOGY.

COLLEGE OF PHYSICIANS OF PHILADELPHIA.

Meeting of the Ophthalmic Section of the College of Physicians, November 16, 1897. The Chairman, Dr. W. F. Norris, in the chair.

Dr. W. C. Posey presented a *Case of Metastatic Uveitis in Both Eyes Causing Blindness, Resulting from an Intense Inflammation of the Nose and its Accessory Sinuses.* A woman, aged 27, had been for several years subjected to the fumes of sulphuric acid, oxalic acid, and chlorin gas while working in a steam laundry. A few months after engaging in this occupation she had a sense of irritation in the nose and tingling in both hands. The nasal inflammation became worse until there was a profuse discharge from the nares and soreness of the mouth and nose. After some months the nasal symptoms subsided, but her eyes became inflamed, and vision, which had commenced to fail, was entirely lost in two years. The conjunctivæ were healthy, the corneæ clear, save for a small nebula near the limbus of the right; the globes were shrunken, quadrate, and soft; the anterior chamber was filled by the thickened, discolored and vascular iris; the pupillary margin indrawn and the pupil filled with organized lymph. This condition, Dr. Posey believes, was the result of emboli consequent upon the intense chronic hypertrophic rhinitis which had induced uveitis and atrophy of both globes.

Discussion.—Dr. B. A. Randall had studied several cases of blindness from optic neuritis caused by nasal disease, but the form of metastatic blindness as exhibited by Dr Posey's patient, was rare. He had operated by iridectomy in a similar condition of absolute blindness, closure of the pupil, low tension, and nystagmus, and the patient had recovered vision in one eye sufficient to enable him to earn his living as a canvasser, an occupation that required extensive traveling. Therefore the prognosis is not altogether hopeless. In answer to a question of Dr. Norris as to the consistence of the iris, Dr. Randall replied that while it was friable, it was sufficiently dense and tough to permit of a clear coloboma and detachment of the excluded pupil.

Dr. Howard F. Hansell exhibited a *Case of Traumatic 3d Nerve Paralysis.* Eight days before, the patient, while gunning, was hit by three No. 4 shot by a companion at the distance of 80 yards, one penetrating the chin, another the soft tissues of the nose, and the third the inner angle of the commissure of the left eye. The lids and conjunctiva were ecchymotic, the ball uninjured but widely divergent and slightly exophthalmic, the pupil dilated and unresponsive, the accommodation paralyzed, and the media and fundus were entirely normal. X-ray photographs, taken by Dr. W. M. Sweet, showed clearly one shot in the nose and another in the apex of the left orbit. The man could rotate the eye only outward, all other motions being completely abolished. At the expiration of eight days the power of the levator and that of the superior rectus had partly returned, otherwise the conditions were unchanged. From the paralysis of all the muscles governed by the 3d nerve it would seem as though the trunk of the nerve had been severed, yet it is hardly conceivable that such a severe injury could have occurred without involvement of adjacent tissues.

Discussion.—Dr. Sweet, by invitation, described the method and the instrument adopted for localizing the shot in the orbit and exhibited several skiagraphs.

Dr. G. C. Harlan reported a *Case of Transient Retinal Arterial Pulse Induced by the Application of Homatropin* in a negro man, 72 years of age, whose general health had been unusually good, with the exception of an occasional attack of subacute articular rheumatism. The left eye was disabled by the results of an attack of kerato-iritis. In the right eye V. $= \frac{15}{c}$. There was no decided increase of tension, the pupil was responsive, the anterior chamber normal, the cornea sensitive, and only moderate peripheral contraction of the field. Homatropin was applied for ophthalmoscopic examination and retinoscopy. The disk was decidedly pale but without excavation, the vessels were slightly narrowed, and there was a very distinct pulsation of the lower branch of the retinal artery. At the next visit, and in a subsequent examination several weeks later, the pulse had disappeared and there had been some improvement of vision under the use of strychnia.

Dr. Harlan referred to a case that he had reported to the American Ophthalmological Society in 1890. The patient was 66 years of age. An energetic pulse of all the larger arteries on the disk was several times produced by homatropin and stopped by eserin. There was only a very shallow cup and no bending of the vessels at its margin. Tension was doubtful and the field and anterior chamber were normal. This patient, some months after the report of his case, had a well-marked attack of glaucoma of which the transient pulse may be considered the first decided symptom. He suggested that, as the effects of homatropin are easily neutralized by eserin, its application might be a permissible means of diagnosis in some doubtful cases. In a recent case of failing V. with decided cupping, but no other positive symptom of glaucoma, in which iridectomy of one eye had been worse than useless, the absence of a pulse after the use of homatropin had been considered a usetul indication.

Discussion.—Dr. Edward Jackson thought the use of homatropin for the diagnosis of glaucoma sometimes justifiable, provided the patient assented and could be kept under observation. He had employed it for this purpose. He referred to a case where duboisin had been used as a mydriatic and had produced the retinal pulse. Iridectomy was done and the patient retained her vision for sixteen years. In the second eye eserin had been resorted to, and later, after glaucoma developed, medical and operative treatment were of no avail and vision was entirely lost.

Drs. C. H. Thomas called attention to the relation of the use of mydriatics in refraction work to possible subsequent blindness, as from optic atrophy, and the chance that the patient may suspect a causal relation and hold the physician responsible.

Dr. G. E. de Schweinitz described some *Cases of Central Amblyopia and their Significance*, dwelling particularly upon the early stages of the toxic variety of this affection, when the scotoma rapidly disappears under treatment and visual acuity is restored to the normal. He suggested, in accordance with recent observations, that the lesion at this stage of the disease is probably a vascular disturbance in the macular tract,—a lesion which antedates either inflammation or degeneration of the involved tissues. One case of unilateral central scotoma was presented in which no cause for the visual defect except the abuse of tobacco and alcohol could be found, but he agreed with Dr. Berry and others, that in spite of the absence of other etiological factors, these unilateral cases should be regarded as of doubtful toxic orgin. Unilateral scotomas as representatives of the stigmata of hysteria were also recorded, and the author was again in accord with Dr. Berry, that although this etiology had been suggested, they were often the forerunners of serious nervous disease. Finally, cases of scotoma occurring in the so-called "neglected eyes" were presented, one of which had vitiated the visual results of a perfect cataract extraction. Dr. de Schweinitz urged the importance of careful examination for scotomas in obscure cases of amblyopia, and described the methods which he had found efficacious for determining these defects in the center of vision when the ordinary coarser methods of examination failed.

Discussion.—Dr. A. G. Thomson related a case of so-called "hysterical scotoma" in a young woman. For a space of ten degrees around the fixation point she was blind for form and color. In ten days this had entirely recovered, and a smaller but negative one appeared in the other eye which up to this time showed no abnormality.

Dr. Risley had recently seen a young woman who presented double optic neuritis with slight swelling, vision gradually sinking to $\frac{1}{10}$, with absolute macular scotoma and peripheral limitation of the field in each eye. No cause could be assigned, although constant hard study through an over-correcting myopic glass might have aggravated the trouble. Under increasing doses of potassium iodid and mercury the scotoma disappeared on one side, and is found only after careful searching on the other; the fields widened and vision was largely restored.

Dr. Harlan suggested that transient scotoma may be due to a slight degree of the same kind of vascular disturbance that, if pushed far enough, would lead to macular hemorrhage.

Dr. W. F. Norris presented a *Case of Tumor of the Orbit in a Child of 12 Years of Age.* A severe traumatism at two years of age caused palpebral ecchymosis. Soon after his parents noticed an unnatural projection of the eye. There is now a tumor, presenting two rounded prominences at the upper inner angle of the left orbit, over which the skin is movable and from which it can be raised in a fold. The eye is forced downward and outward, and its motions upward and inward are almost abolished, while in every other direction they are of considerable extent. Pressure on the eyeball does not force the eye backward into the orbit, nor cause any diminution in the size of the swelling, nor does it cause any dizziness, alteration in the movements of the eyes, difficulty of breathing, nor any other sign of cerebral disturbance. Pressure on the projecting part of the tumor, however, forces the eyeball still further downward and outward, while pressure on the eyeball renders the tumor more tense. There is no hard lump to be felt, no pulsation, and no bruit. The tumor is a fluctuating mass, which apparently extends backward along the roof and inner side of the orbit and which lies outside of the muscle-funnel. The vision in the right eye is $\frac{5}{5}$, in the left, $\frac{5}{7}$. The media are clear and the intra-ocular ends of the optic nerves healthy. The growth appears to be a cyst extending far back into the orbit, and the question arises what sort of a cyst it is. It is probably not an encephalocele, as it does not diminish and no cerebral symptoms are produced by pressure. Fissures between the orbit and the cranial cavity often diminish or close during growth, and diagnosis is therefore difficult. Its consistence makes it probable that it is not a fibro-cystic tumor. The absence of neuralgic pain and its slow growth argues against its being an echinococcus. It seems to me more likely that it is a dermoid cyst, which was overlooked till the patient was two years old, and that the accidental injury which then occurred caused it to grow and to excite attention. I propose, therefore to remove the tumor, while endeavoring to preserve the eyeball.

Discussion.—Dr. de Schweinitz had removed a similar tumor, by dissection, from the upper and outer angle of the orbit. It was found microscopically to be a cystic angio-adenoma of the lachrymal gland. Drs. Risley and Randall alluded to cases that were distinctly dermoids, the latter being firmly attached to the orbit.

Dr. Edward Jackson read a paper on *The Technique of Needle Operations on the Lens and Capsule*, and called attention to certain points with reference to these operations. In some cases discission of the lens differed essentially from division of the capsule. To avoid the escape of lens matter into the anterior chamber, the opening in the capsule should be small, and to get such a small opening and yet freely divide the lens, it was necessary to bring the opening in the capsule close to the opening in the cornea, by letting the aqueous escape. But to divide a membrane after cataract extraction the longest possible sweep of the cutting edge was best, and this was obtained by entering the needle through the limbus. This point of entrance also reduced to a minimum the risk of infection, because the wound in vascular tissue closed promptly after the operation. In dividing a capsule it was often best to carry the incision through those portions to which posterior synechia were attached, thus freeing the iris from an irritating drag upon it. He also called attention to the difficulty of securing a crucial incision and the greater certainty of success in making a T-shaped incision, which would allow sufficient gaping to give the required clear pupil.

HOWARD F. HANSELL,
Clerk of Section.

CHICAGO OPHTHALMOLOGICAL AND OTOLOGICAL SOCIETY.

A regular meeting was held December 14, 1897, with the president, Dr. Wm. T. Montgomery, in the chair.

Dr. Horace M. Starkey made some remarks on the *X-rays in Ophthalmology*, and reported two cases where the X-ray had been successfully employed in locating particles of steel in the eyeball.

The first case was that of a man aged thirty-one, sent by Dr. Larkin to Dr. Starkey's service at Mercy Hospital, June 29, 1897. The day before, while at his work as a machinist, a piece of metal, or scale, rather, had flown from his chisel and injured his left eye. When seen, the left eye and eyelids were red, conjunctiva quite ecchymotic, cornea had a ragged laceration extending across its upper part, about as long as an incision for cataract extraction, extending to the ciliary body at the outer side, and nearly to that body on the inner side. The iris was lacerated and incarcerated, the lens opaque, and the wound large and ragged. Nothing could be seen within the eye, and the case was treated in the usual manner. He stayed in the hospital two weeks, and left much improved, being seen once or twice afterward at intervals of a week. About a month from the time he first came into the hospital, the eye began to show a little softening, though it had cleared up sufficiently at the inner side to see the red reflex. It was evident that the eye was hopelessly damaged, and symptoms of sympathetic irritation appeared in the other eye. August 20th, a skiagraph was taken with a view of locating the foreign body, which showed, very definitely, that a large piece of metal was present in the eye. An attempt was made to extract the iron with a strong electro-magnet, and this, being unsuccessful, the eye was removed.

The second case, a machinist who had been working with a bit, thought his eye was injured by a piece of metal. An examination showed distinctly a perforation of the cornea about a third of the way from the center at the lower border, and a little punched out perforation of about the same size through the iris. The lens was opaque, so that the interior of the eye could not be seen. There was also hemorrhage. A foreign body was detected by the skiagraph. No pain was present until the following morning. The next day there were present hypopyon and evidences of severe septic inflammation of the eye. An unsuccessful attempt was made to remove the steel with the magnet. The eye was then enucleated, and on section the piece of steel was found, surrounded by a clot of blood, at the back of the eye just below the optic nerve entrance.

The third case occurred two years ago, before there was any possibility of using the X-ray. It was a good case for the use of the electromagnet. The media were clear. Doctors Wilder, Mann and Hawley studied the case with Dr. Starkey for a number of days, and concluded that a piece of metal was present, swinging in the vitreous in the anterior part of the fundus. It was free from exudate, and presented a glistening appearance. On examining with the ophthalmoscope, a broad and narrow side alternately presented itself towards the examiner. On consulting another ophthalmologist he was told that the foreign body was merely a clot of blood which would become absorbed, and no attempt was made to remove it. Eventually the eye was lost, and sympathetic irritation began in the other eye. The eye was then removed, and the particle was found in the situation as seen with the ophthalmoscope.

Discussion.—Dr. C. D. Westcott asked Dr. Starkey if it is necessary to make long exposures in these cases, and if there is any danger attached to the application of the X-rays to the eye.

Dr. Casey A. Wood said he was among the first to interest himself in the use of the Roentgen ray and its application to the localization of foreign bodies within the eyeball and orbit. After some little experience with it he became so disgusted with the absence of results that he was indiscreet enough to say that he did not consider it of any value whatever. About that time Dr. Sweet and others in Philadelphia had been more successful, with improved apparatus, in localizing foreign bodies within the eye. His first experience has followed him, however, even to the present day. Two or three weeks ago a man appeared in his office with, presumably, a foreign body in his eye. The taking of a skiagraph was at once suggested, so that its position could be determined with a view to removal. It so happened that living in the patient's immediate neighborhood was a man who had the X-rays used upon his head some months ago, and was exposed to the rays, during the skiagraphy, from three-quarters of an hour to an hour and a half. As a result of this he had lost a portion of his scalp and most of the surrounding hair, following a local cellulitis. Dr. Wood's patient, accordingly, would not, despite his representations, allow the "infernal machine" to be turned on him. He was glad to say, however, that since then, as Dr. Starkey has so well shown this evening, with a very short exposure and by means of triangulation the early crude instrument has been so much improved that this method of diagnosis is rendered effective, easy of application, and perfectly harmless.

Dr. Albert B. Hale had made several experiments with the X-ray and obtained similar results to those mentioned by Dr. Wood, when this matter was brought before the profession, but they were subsequently modified by the use of improved apparatus. An interesting discussion had taken place at the Philadelphia meeting of the American Medical Association on this subject. It was, however, maintained that good results could be obtained by triangulation methods. In only one case has Dr. Hale used the X-ray with considerable liberty. He made several exposures in all directions with varying strengths of the ray in approximated tubes, and did not get any cellulitis or loss of hair. The patient was a young woman, was willing to submit to the X-ray, and there was absolutely no trouble from it. He was unable to localize anything, and does not know whether failure in this case was due to the absence of a foreign body or to some error on part of the X-ray.

Dr. Horace M. Starkey said: The exposure is very short, never longer than eight minutes, and usually from two to four minutes. He does not think there is any danger of erythema, falling of the hair, or changing of the color of the hair, from four minutes exposure. In the skiagraph of the eyeball of one of the cases there was a ten minute exposure, because a low vacuum tube was used. The coats of the eye are relatively transparent to the X-rays, hence it required much longer time for the rays to cast a shadow.

Dr. Henry Gradle asked if any gentleman has had any personal experience with the large stationary magnet in either extracting iron chips from the eye, or in recognizing them, and is such a magnet to be had in the city. It is an expensive apparatus, and the occasions for its use in private practice are not very frequent.

Dr. Hale: The Western Electric Company will fix up a magnet any time for experimental work or other purposes. They will make a magnet of any required strength for the use of oculists.

Dr. K. K. Wheelock, of Fort Wayne, read a paper entitled *Tropho-Neurotic Keratitis* which will appear in full in the February RECORD.

Discussion—Dr. Wm. H. Wilder recalled several cases in his own experience that were extremely difficult to classify, and which possibly might be placed under the head of Tropho-Neurotic Keratitis. He had a case now, just recovering, which has been under treatment for fifteen weeks. It was one of those obstinate superficial ulcers of the cornea, beginning, as we sometimes see cases of herpetic keratitis, gradually spreading until it involves the whole surface. Everything he could think of was tried, cauterization with nitrate of silver, carbolic acid, and galvano-cautery, and nothing seemed to give so much relief as the method recommended by Swanzy of applying absolute alcohol to the cornea. After such an application there would be much relief. This was repeated on three different occasions. Since the last application there has been no more trouble. Dr. Wilder does not know whether we can all agree with the author of the paper that these conditions are dependent upon some disturbance of the trophic nerves that exist in the Gasserian ganglion. Possibly all such cases are in a certain sense dependent upon some lesion of the trophic centers, because so often they are associated with some peculiar form of malnutrition. It is reasonable that we should classify them in the same group with those peculiar cases described by Haab and others, which come on after a febrile attack. The cause may be a malarial poisoning, in which cases the ulcer would assume a peculiar dendritic form, or there might be only a few isolated spots of infiltration in the cornea. At any rate all such cases seem to be allied to herpes in origin, and are often associated with herpetic efflorescenses on the margins of the lips and nose, such as may follow bronchitis, measles or any febrile disease. This is not herpes zoster, which is a much more serious affection, but is simple herpes or herpes febrilis.

One point of interest which Dr. Wheelock brings up is the absence of sensibility of the cornea. In these cases there is a diminution of sensation, a very important point, and one upon which not enough emphasis has been laid.

Dr. W. F. Coleman recalled two similar cases. One was a male, the other a female, both about twenty-five years of age. They at first eluded any diagnosis as to the cause of the disease. Both had ulcers of the cornea. One case passed through the hands of an excellent oculist, who relieved the patient and sent him home. In a few days he returned, and fell into Dr. Coleman's hands. After getting a detailed history of herpes zoster of the forehead and scalp in each of the cases, the patients were put on various remedies to relieve the intense pain, which was only temporarily eased by large doses of chloral, morphine, and quinine, but permanently relieved by sodium salicylate, the improvement being very marked and sudden. The further treatment consisted of electricity, which seemed to rapidly and permanently benefit the condition. Dr. Coleman wished particularly to mention the beneficial and rapid effect of the sodium salicylate.

Dr. C. P. Pinckard reported a case, now under treatment, which, while not neuro-paralytic, perhaps, resembles such cases in some respects. Some four weeks ago he was called to see a lady, about seventy years old, who had an herpetic eruption on the outer part of the skin of the upper lid. There was marked edema of both lids and conjunctiva, accompanied by redness and considerable pain. Later there appeared herpes on the side of the nose and temple. The whole corneal surface became hazy, especially at the periphery. At the same time, the cornea became very anesthetic. There was, and is still, some circum-corneal injection, but it is not very great. There has been no pain, nor has a vesicle formed on the eye. It seemed to Dr. Pinckard that this condition is a true neuropathic keratitis; whether paralytic or not, it is hard to say. The herpetic spots on the face have healed, but no change has taken place in the cornea.

Dr. Henry Gradle had some hesitation in speaking at first, because he had no observations strictly analogous to those given by the speaker in his paper. But, as the discussion is wandering somewhat, it may not be amiss to refer to some of the topics. It seems to him the other speakers have not made the sharp distinction that there is really between ordinary herpes and herpes zoster. They are separate and distinct diseases. Dendritic keratitis, as mentioned by Dr. Wilder, can begin as corneal herpes. He had seen two cases this year where it began as distinct minute herpetic vesicles, subsequently developing into the dendritic form. We know how persistent this is. In these cases there is no diminution in sensibility.

He had seen two instances of corneal involvement in the course of herpes zoster. The cases had begun before he saw them. In neither case was the ulceration quite as important as the keratitis. There was a diffuse haze of the cornea.

In these cases of keratitis and corneal ulcer following herpes zoster of the forehead, there is a great deal of pain, in spite of diminution of sensibility, or even anesthesia to direct touch of the conjunctiva and cornea, but evidently the deeper tissues are not devoid of sensibility, because the pain is excruciating in this trouble. It is well known that some of the cases are followed by serious consequences. Some get iritis, others even panophthalmitis. One of his cases was followed by paralysis of one of the recti muscles.

The statement of Dr. Wheelock as regards the influence of the trophic nerves on the cornea is open to question. Physiologists hesitate at the present day decidedly before accepting trophic nerves as positively proven. It is true that by division of the trigeminus we can almost invariably produce corneal ulceration in animals, but at the same time, mechanical means, such as sewing a shield of wire screen to the lids will prevent this ulceration. It is perhaps unsettled whether section of the nerve injures the cornea by dessication on account of the absence of reflex lid movements or by permitting injuries to occur without the notice of the animal, but the existence of true trophic nerves is as yet a hypothesis.

Dr. Wheelock cited the first case of herpes zoster ophthalmicus for the reason that through it his attention was first attracted to the recognition of corneal insensibility as a valuable factor in the diagnosis of a certain class of cases; and what he saw in that case led him to note these various points and the peculiar influence of faradization upon the insensible cornea. He has had, perhaps, half a dozen cases of tropho-neurotic keratitis. In searching the literature of this subject he had not found any clear, concise report of such cases. There had been a jumbled, imperfect, composite picture of several kinds of corneal affections brought together under the head of neuro-paralytic ulcer, but nothing distinctive; and he brought this report up for the purpose, if possible, of establishing a distinct classification for this class of corneal affections and putting them where they really belong, viz: as tropho-neurotic keratitis. Dr. Wheelock believes that he is perfectly correct in his observations. The weight of experimental physiological testimony is stronger in favor of special trophic fibres in the Gasserian ganglion than it is against the presence of such fibres.

Dr. F. C. Hotz opened the discussion on *Holocaïn.* At the October meeting he read a brief report of his observations with holocaïn. When the report was published Dr. Würdemann wrote that his experience had been in some respects different from his, and asked whether it would be agreeable to have this matter brought up for discussion at a subsequent meeting. At the October meeting Dr. Hotz stated that holocaïn was a very prompt, quick-acting anesthetic, but seemed not to penetrate deep enough to make it of value for more extensive and deeper operations especially those involving the opening of the eyeball. He gave a number of instances and compared the effects of holocaïn and cocain in the same patients. He has since used the remedy quite frequently and can say that his results have been about the same. For instance, he had occasion to use the electro-cautery on an episcleritic nodule; the cornea and conjunctiva were profoundly anesthetized at the end of a minute, another drop was instilled after the first application and two minutes later the cautery applied. The superficial anesthesia was complete, but the cautery caused the most violent pain. In tenotomies and advancement similar results have been obtained as those reported at the previous meeting, so he still holds to the opinion that holocaïn is not as deeply acting as cocain.

Dr. H. V. Würdemann of Milwaukee followed; his paper *A Further Report on Holocain as a Local Anesthetic in Ophthalmic Work* appearing in in full on page 7.

Discussion—Dr. Bulson: How many double iridectomies did you do?

Dr. Würdemann: One. The patient was an old Irish woman, very nervous and ignorant, who said that she did not feel any pain. In this case a double iridectomy was made at one sitting, the first eye by himself and the second was operated on by his associate. In one eye the tension was great, so that the iris prolapsed at once. In this case one eye was completely blind from glaucoma, and also cataractous. The other eye was cataractous, but perception of light was fair. Two weeks ago the lens was extracted. By and by it will be necessary to perform discission of the capsule. Vision is now equal to counting of fingers. The three operations in both eyes were done with holocaïn.

Dr. Wood: Have you examined the cornea with a Coddington lens after the instillation of more than one drop of holocaïn solution and noted any changes at all?

Dr. Wilder asked Dr. Würdemann whether he has had much experience with injecting it beneath the skin to produce anesthesia.

Dr. Hale, in answer to the question of Dr. Wilder, said that according to several German reports, holocaïn has been injected hypodermically and it seems to have a toxic effect. Injected with the needle its local anesthetic effect is good, but the absorption produced by it is much more dangerous than a dose of cocain.

Dr. F. C. Hotz thought that there was not much difference between the views expressed by Dr. Würdemann and his own, except as he stated on a previous occasion that he considered holocaïn a more superficial anesthetic than cocain. He cannot quite understand on what ground Dr. Würdemann claims the absorption of holocaïn. The absorption is a sort of osmotic process, and has nothing to do with the circulation. Now if there is an insufficient effect of atropin in cases of iritis and a drop of cocain is instilled preceding the use of atropin, a better mydriasis is often obtained; hence cocain should rather favor absorption of the remedy by osmosis. Dr. Hotz does not stop during an operation on the muscles to apply any more of the anesthetic, because it has always seemed to him that when the blood begins to flow, there is not much benefit from these after applications. All the benefit is derived from the primary applications. There is one other point he wished to speak of and that is, he has put holocaïn in his own eyes to test the duration of the anesthetic, and has found by several experiments that at the end of five minutes he begins to feel slightly the touch of the instrument, and then sensation would rapidly recover. The pain connected with the application of holocaïn was most intense, in his own eye, for half a minute. One per cent. solution was used. He felt the after-effects for hours. There is one advantage in that the solution is very stable; it does not undergo any chemical or bacteriological change. It is not necessary to get a new solution every time an operation is performed.

Dr. John F. Fulton, of St. Paul, Minn., has used holocaïn for the past few months altogether in his clinic for its local anesthetic effect, and is pleased with it, especially in the removal of foreign bodies in the cornea, such as cinders, where slight anesthetic effect is needed without interfering with the accommodation. He can confirm what Dr. Würdemann has said, who first drew his attention to this local anesthetic. The most important advantage in addition to that, is its action upon inflamed tissue. It is well known that cocain does not act upon the inflamed conjunctiva, and consequently in removing the stitches following an operation in which the conjunctiva is cut through this is a great advantage. In any form of inflammation of the eyes, where a local anesthetic is desired, he considers holocaïn of great advantage. It is a valuable addition to our armamentarium. It is extremely useful in certain cases in which cocain cannot be used with advantage. For cataract extractions Dr. Fulton still prefers cocain. He believes that it produces in the non-inflamed eye more complete local anesthesia. Again, holocaïn does not seem to contract the blood vessels of the conjunctiva as cocain does, although the local effect is more satisfactory.

Dr. Würdemann, in response to Dr. Wood's question, said he has not yet examined the cornea with a Coddington lens after the use of holocaïn, and has had no experience in injecting holocaïn subcutaneously. It is, however, about four times more toxic than cocain, and is not to be used subcutaneously. He does not believe any one has yet tried the combined action of cocain and holocaïn, either locally or subcutaneously. In a recent article, an abstract of which is published in the *Annals of Ophthalmology* (p. 820, October, 1897,) there will be found a note upon combined cocain and eucain anesthesia for subcutaneous use. The conclusion that holocaïn was more readily absorbed was arrived at from the fact that its anesthetic effect may be indefinitely prolonged, and it seemed to him that the reason why cocain anesthesia could not be indefinitely prolonged was that the blood supply was cut off, although absorption is largely a question of osmosis. It was first used upon his own eyes and those of others before any operations were performed or applied to the eyes of patients. It was noticed that a peculiar cooling sensation existed probably an hour after its application. In one per cent. solution it creates no irritation, no more than from a five per cent. solution of cocain.

Dr. Bulson: If holocain is four times as toxic as cocain is it not possible by prolonging its use to get a toxic effect?

Dr. Würdemann said it is used in one-fifth the strength of cocain—a one per cent. solution. The introducer warns against its subcutaneous use as it produces clonic spasms like those of strychnia when injected under the skin of animals. Locally no effects have been observed by any one.

The Wochenschrift für Therapie und Hygiene des Auges is a new weekly ophthalmic journal, which commenced its publication last November. It is edited by Dr. Wolffberg, of Breslau, No. 9 Freiburger Strasse, with the assistance of Prof. Herm. Cohn, of Breslau, and Doctors Elze, Gottschalk, Herrnheiser, Jacobsohn, Krienes, Ohlemann and Wintersteiner.

If the number for January 1, 1898, is an indication of the future character of the journal, all those who read German should subscribe.

THE Sixty-first annual report of the Ohio State Institution for the Education of the Blind, was filed with Governor Bushnell Friday. There were 301 pupils at the institution during the year, the daily attendance averaging 292½. Seventy-three of the eighty-eight counties of the State were represented in the attendance. Eight pupils graduated at the annual commencement. Dr. L. M. Early, the physician, reports that the health of the pupils was remarkably good throughout the year. There were no deaths.

Dr. J. E. Brown, the oculist, who is employed to treat the eyes of such of the pupils as can be helped in this way, reports that 35 per cent. of the cases of blindness are the result of preventable diseases. It is, therefore, clearly within the power of science to greatly reduce the number of blind. — *Cleveland Journal of Medicine*. Dec. 1897.

NEWS ITEMS.

Personals and items of interest should be sent to
Dr. Frank Allport, 92 State St., Chicago.

For Sale or Exchange. Knapp's Archives of Otology, volumes eight to twenty-four, inclusive.

Cassius D. Wescott, 31 Washington Street.

Dr. George Kinney, of Burlington, Iowa, has returned from Europe, where he has been spending some time in the London and Paris hospitals.

Dr. George H. Price, of Nashville, Tenn., one of the first editors of The Ophthalmic Record, was married the 15th day of December. The name of his bride was Miss Mattie Barr Sperry, also of Nashville, Tenn. The Doctor and his bride are now off on a southern tour.

The third annual meeting of the "Western Ophthalmological, Otological, Laryngological and Rhinological Association," of which Dr. B. E. Fryer, of Kansas City, is president, and Dr. Frank M. Rumbold, of St. Louis, is secretary, will hold its third annual meeting in Chicago next April. A local committee has been appointed to take charge of the meeting and provide for its entertainment. The officers of this committee are Dr. J. Elliott Colburn, president, Dr. H. H. Brown, treasurer, and Dr. T. A. Woodruff, secretary.

It is to be hoped that the meeting will be a large one, and that gentlemen engaged in these lines of practice from all over this western country will be sure to attend.

The 9th semi-annual session of the Central Texas Medical Association met at Hillsboro, Tex., Jan. 11th and 12th, 1898. This Association possesses a Section of Ophthalmology and Otology of which John O. McReynolds, M.D., of Dallas, is Chairman, and R. E. Moss, M.D., of San Antonio, is Secretary.

Papers read before this Section were as follows:

1. Report of Chairman, Dr. J. O. McReynolds, Dallas.

2. "Nervous Reflexes, their causes, etc.," Dr. W. F. Cole, Waco.
3. "Wounds of the Cornea," Dr. D. E. Seay, Dallas.
4. Report of Cases, Dr. R. E. Moss, San Antonio.
5. "Systemic Remedies in Eye Diseases," Dr. S. W. McJunkin, Dallas.

A CERTAIN firm of opticians, located no less than a thousand miles from Chicago, has the assurance to sent out the following circular letter:

DEAR SIR:—

"We will pay you $3.00 cash, out of the first money received, for every case of cataract you can send us.

We have a remedy, "Jubannia," which cures cataracts, even senile cataracts, by absorption. It is perfectly harmless when used as our oculists prescribes it and is absolutely curative in curable cases.

We employ a physician whose opinion is reliable and who passes upon each case.

Upon request we will mail you literature regarding the remedy, "Jubannia."

Below please find blanks for names. Your own name will not be mentioned to the patient unless you desire it.

Very respectfully,

————————."

PROF. EDWARD L. HOLMES, for many years the distinguished president of Rush Medical College, has resigned to be succeeded by Dr. Harper, of the Chicago University. This move was necessary in order to complete the amalgamation of Rush Medical College with the Chicago University. Dr. Holmes has for many years been one of the leading ophthalmologists and otologists of this country, and his friends hope that he may live many years to enjoy the confidence and respect of the profession and community amongst whom he has lived. Dr. Holmes will be seventy years of age February 11, and his resignation will take effect at that time. More than a year ago it was rumored that Dr. Holmes would resign from the presidency of Rush Medical College on the attainment of his seventieth birthday, in order to make room for a younger and more active man. He was the first physician in Chicago to limit his practice to diseases of the eye and ear, and was the founder of the Illinois Eye and Ear Infirmary, which has so long been one of the landmarks of this city. He became Professor of Ophthalmology and Otology in the Rush Medical College in 1860, and accepted the presidency in 1883. Dr. Holmes was one of the original workers at the Presbyterian Hospital, and has been identified with the best and most progressive work in ophthalmology and otology in the city of Chicago. The OPHTHALMIC RECORD congratulates him upon his long and honorable career, and hopes that he may live long to enjoy the fruits of his labor.

WE are promised next June a new work entitled, "An American Text-Book of Diseases of the Eye, Ear, Nose, and Throat."

It will be edited by Dr. G. E. de Schweinitz and Dr. B. Alex. Randall, of Philadelphia, which is of itself a guarantee of the high character of the work. It will be for sale by subscription only and will consist of one magnificent volume of about eleven hundred pages, fully illustrated, uniform with other volumes in the American Text-Book Series. Prices approximately, cloth, $7.00, sheep or half morocco, $8.00 net. Orders mailed now to the editors will be filled without delay when the work is issued.

The list of contributors is as follows:

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THE

OPHTHALMIC RECORD

A MONTHLY REVIEW OF THE PROGRESS OF OPHTHALMOLOGY.

VOLUME VII. CHICAGO, FEBRUARY, 1898. NO. 2. NEW SERIES

ORIGINAL ARTICLES.

REMOVAL OF THE CLEAR CRYSTALLINE LENS FOR HIGH MYOPIA.*

BY EDWARD JACKSON, A.M., M.D.

Professor of Diseases of the Eye in the Philadelphia Polyclinic, Surgeon to Wills' Eye Hospital.

PHILADELPHIA.

The patient presented this evening P. S., aged 24, laborer, applied at Wills' Hospital, April 3d, 1897, seeking to have his sight improved by operation. He felt that his vision was so poor as to largely disqualify him for manual labor, and he had never been able to get glasses that were satisfactory; neither was he satisfied with the correcting lenses when we tried them on him.

The right cornea presented near its center an oval facet 3½ mm. long by 2½ mm. wide, slightly hazy, through which could be seen the details of the fundus, with a strong convex lens, the hyperopia amounting to 15 D., while the refraction of other portions of the pupil was myopic about the same amount. The disk was red and hazy, with a crescent of sclera one-half its width extending around it. The choroid was generally thinned. The crystalline lens was clear, no vitreous opacities were noticed.

The left eye showed higher myopia and a large, irregular area of choroidal atrophy surrounding the disk, extending equally to the nasal side, with black patches of pigment. The lens and vitreous were clear, as in the other eye. The determination of the refraction with the ophthalmometer was unsatisfactory. The note made being, "Refraction 45 D. with irregular astigmatism." By skiascopy and the test lenses we found:

R. — 13.50 $\overset{\frown}{\smile}$ — 3.25 cyl. ax 55 V. = $\frac{5}{30}$ths.
L. — 18.50 $\overset{\frown}{\smile}$ — 1.50 cyl. ax. 100 V. = $\frac{5}{25}$ths—1.

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*Read before the section on ophthalmology of the College of Physicians of Philadelphia, Dec. 21st, 1897.

April 6th, after the plan of Fukala, a free crucial incision was made in the lens of the left eye, extending into the nucleus. It was followed by prompt swelling and opacity of the lens, a pericorneal zone of hyperemia, and the filling of the anterior chamber with lens matter.

April 13th. The inflammatory reaction was severe and the eye becoming painful, but the tension was normal. A linear incision was made with the keratome and the lens matter extruded by pressure and washed out with Lippincott's syringe. For many weeks the eye remained hyperemic and very irritable. Division of the posterior capsule revealed decided haziness and opacities of the vitreous, which cleared slowly.

July 15th. With correcting lens + 2.50 $\overset{\frown}{\smile}$ + 2 cyl. ax. 160° the left eye had gained vision of $\frac{5}{25}$ths. Up to that time its vision with the best correcting lens had continued distinctly worse than it was with the correcting lenses before the operation.

September 28th. The crystalline was opened in the right eye by a small cut in the capsule with the free division of the nucleus. Two days later there was marked opacity of the nucleus and radiating in all directions from it, as perfect a star as I have seen in connection with posterior polar cataract.

October 12th. The lens was becoming generally hazy, one small piece of lens substance had fallen to the bottom of the anterior chamber. The iris was pressed against the cornea by the swelling of the upper portion of the lens, and within the last two days some pericorneal redness had developed. The ophthalmometer showed corneal astigmatism 2.5 D. ax. 160°. A corneal incision was made about parallel to the meridian of least curvature of the cornea, 60° or 70°. The nucleus and two-thirds of the cortex was removed, again using Lippincott's syringe to wash out the anterior chamber. After this the eye quickly became normal, and the subsequent division of the capsule and remaining cortex gave a clear pupil. With correcting lenses:

R. + 2.50 $\overset{\frown}{\smile}$ + 2. cyl. ax. 75° V. = $\frac{5}{9}$ths.
L. + 2. $\overset{\frown}{\smile}$ + 2. cyl. ax. 160° V. = $\frac{5}{9}$ths.

Many hundreds of cases of removal of the clear crystalline lens for high myopia have been reported in Europe, particularly in Germany. But so far as I can now recall no case like the above has been reported in this country.

In the paper of Herbert Harlan, entitled "Contribution to the Question of Removal of Lens in Myopia" (*Trans. Section on Ophthalmol. Amer. Med. Assoc.* 1896) are reported a case of removal of the clear lens which had been dislocated into the anterior chamber by a blow, and one of the accidental removal of the lens many years previously.

Alt's case reported in *The American Journal of Ophthalmology* for June, 1895, was one in which the lenses had become so far dislocated that the upper margin was just seen in the undilated pupil.

Most operators have from time to time removed unripe cataracts, and as the choroidal cataracts of highly myopic eyes mature very slowly, and are not very well suited to ripening operations, it has sometimes happened that such unripe cataracts were removed from highly myopic eyes. Thus in a patient from whom I extracted the crystalline lens at the Philadelphia Polyclinic, October, 1893, the vision prior to operation was $\frac{4}{120}$ths, and the refraction of the eye after operation was a mixed astigmatism, the correction of which gave vision of $\frac{4}{25}$ths. But such cases are not cases of removal of the clear lens for high myopia.

In view of the readiness of surgeons in this country to take up new operations there must be some special reason for their neglect of this procedure. Probably, it is partly because high myopia has been more generally relieved by lenses here than abroad. Certainly the statements made that patients can never wear lenses of more than 13 or 15 D. with satisfaction is disproved by our practical experience. In a paper read before the *Philadelphia County Medical Society* June 8th, 1897, I called attention to the fact that higher degrees of myopia can frequently be corrected by lenses, and reported several cases of the kind.

Then, too, the reports regarding the results of removal of the crystalline published in Germany bore upon the face evidences of inaccuracy. For instance, Von Hippel in reporting a series of 114 removals of the clear lens for high myopia, gave what purported to be the refraction of these eyes before the operation, and for only two of the eyes was astigmatism mentioned. No one who has done much at the accurate measurement of myopia can be made to believe that such statistics represent at all accurately the actual refraction of the eyes operated on. No such series of high myopias without astigmatism could be found. And while the accurate determination of the refraction prior to operation may not have been of great importance to the patient, the failure to make such accurate determination greatly detracts from the scientific value of such reports. Without determination and correction of the astigmatism, determination of the acuteness of vision was, of course, impossible ; and all statements regarding the improvement of vision by operation, when based on such statistics, must be regarded with grave suspicion. Such glaring inaccuracies and looseness of statement certainly did not tend to advance the views with which they were associated, and which were in direct opposition to the positive opinions of the great authorities of ophthalmology.

When Mooren first reported his cases at Heidelberg in 1858, Graefe strongly opposed such a procedure. Donders said (*Accommodation and Refraction of the Eye*, page 416) "When in a case of highly myopic structure of an eye, a lens affected with cataract has been successfully extracted, and a nearly emmetropic condition has been obtained, the operator has been exposed to the temptation of endeavoring, by the abstraction of a normal lens, to remove the myopia. A patient who was an amateur in dioptrics, endeavored to induce me to perform this operation.

"But I need not say, that such a momentous undertaking, doubly dangerous where a myopic eye and a transparent lens are concerned, without that, even in the most favorable cases, any real advantage is to be expected, would exhibit culpable rashness. Not only would the staphyloma posticum continue equally threatening, but we should also have sacrificed the accommodation — an advantage which that of somewhat larger images than would be obtainable by neutralizing glasses, could by no means counterbalance."

In spite, however, of the disrepute into which the weight of its opponents, and the loose assertions of some of its friends have been calculated to bring it, I believe that the removal of the clear crystalline lens for high myopia is a real addition to surgical therapeutics, fully justified and demanded in certain cases. How numerous these cases are, and just the extent and nature of the benefits to be conferred by it, are still to be determined. To aid in that determination, and in the selection of cases for which it is appropriate, certain questions as to the effects of operation need to be discussed; and all cases on which it is tried should be fully reported.

In the first place, among the papers upon the subject emanating from German operators, it seems strange that there has been no intelligent discussion of the optical effect of the operation. So far as I know, it is only in a paper by Percival (*Archives of Ophthalmology*, 1897, p. 1) that it is incidentally brought out. Every one at all acquainted with the subject knows that the removal of the crystalline lens will diminish high myopia. But, so far as I know, no one has yet pointed out to just what extent we should expect the refraction to be changed by the operation. Even our authorities on the subject of refraction have unwittingly obscured this question instead of throwing light upon it. Helmholtz while discussing the refraction of the aphakic eye does not, in his *Handbuch der Physiologischen Optik*, take up the special question of the effect produced by removal of the lens in high myopia, and its difference from the effect (as measured at the cornea) produced in emmetropic or hyperopic eyes.

Donders (*Accommodation and Refraction of the Eye*, p. 312,) makes only this allusion to it, "A case even occurred to me, in which the accuracy of vision of distant objects was incapable of improvement by either positive or negative glasses. In this instance, the visual axis of the eye, emmetropic with aphakia, had actually a length of rather more than

30mm.; and we may assume that so long as the crystalline lens was still present, myopia of about ⅓ (inch) had existed."

Landolt (*Refraction and Accommodation of the Eye* p. 414) is more definite and more misleading. He says, "The only eyes that do not become hyperopic upon losing the crystalline lens, are those which are myopic 11 D. or more, i.e., eyes which before this loss, already have at least 11 D. of refraction in excess. The removal of the crystalline will render a myope of 11 D. exactly emmetropic while myopia of 20 D. would be changed by it into a myopia of 20.–11.=9 D."

It is interesting to compare the above statement with Landolt's own figures in other portions of his book. Thus (page 79), he makes the second focal distance of the cornea 31.095mm. That is the distance the retina must lie behind the summit of the cornea to have parallel rays accurately focused upon it by the refraction of the cornea alone. And on page 140, he gives the antero-posterior length of an eyeball having 18 D. of myopia as 30.85mm. and of one having 19 D. of myopia as 31.47mm. That is an eye having 18.5 D. of myopia would be just sufficiently elongated to be rendered emmetropic by removal of the crystalline lens, to have parallel rays focused on the retina by the average refraction of the cornea.

This existing uncertainty in the literature of the subject, justifies us in going somewhat into detail with regard to the optical effect of removal of the crystalline lens. The determination of this is important in every case for which removal of the clear crystalline is to be considered. While neither very difficult or tedious such determination is not materially helped by either the schematic eye of Listing, or the reduced eye of Donders and others. These deal with the refraction of a single system, the reduced eye with the refraction of a single surface, the schematic eye with the refraction at three surfaces, but reduced to a single set of cardinal points.

In the problem before us, we have to do with the refraction of two different refractive systems, those of the cornea and the crystalline lens, situated some distance apart; and with the effect of subtraction of one of these refractive systems. Since problems of this sort have become of actual importance in practice in connection with removal of the clear lens for myopia, it seems proper to introduce for their convenient solution, still another conception of the refraction occurring within the eye.

I propose that we regard the refraction of the eye as produced by two infinitely thin lenses, the one situated at the summit of the cornea having a focal distance of 31.mm., about equal that of the cornea (refractive power equal to about 32.25 D.), the other lens situated 6 mm. back of the summit of the cornea, having a focal distance of 50 mm. (refractive power of 20 D.) Such a scheme might be called a *dioptric eye.* The accuracy with which it represents the average human eye may be seen by comparing these dimensions with those adopted by Helmholtz (*Handbuch der Physiologischen Optik*) in his earlier studies of the subject, and with those preferred in his later work. It will be noticed that the first and second principal points of the crystalline lens really lie within one-fifth of a millimetre of each other, and so nearly 6mm. behind the cornea, that the conception of refraction by the lens at a single principal plane at 6mm. behind the cornea does no violence to the facts.

TABLE.

	Dioptric Eye.	Helmholtz, earlier.	Helmholtz, later.
Focal distance of cornea	31.	31.692	31.095
Focal distance of crystalline	50.	43.707	50.617
Depth of crystalline behind cornea	6.	-----	-----
Depth of anterior principal point of crystalline	-----	5.707	5.726
Depth of posterior principal point of crystalline	-----	5.936	5.924
Length of eyeball	22.667	22.231	22.819
Refracting power of cornea	32.26	31.36	32.16
Refracting power of crystalline	20.	22.88	19.75
Total refractive power of eye	44.12	44.90	43.82

The value of this conception of the dioptric eye will appear as we work out the actual change produced in different cases by removal of the second refracting element, the crystalline. In the normal emmetropic eye the rays which struck the cornea parallel reach the second lens, the crystalline, converging to a point 31. mm.—6=25 mm. behind it. They reach the crystalline, then 40 D. convergent. To this is added 20 D., the converging effect of the crystalline, making 60 D. The rays are, therefore, focused 1000÷60=16.667 mm. behind the crystalline. 16.667+6=22.667, the antero-posterior axis of the emmetropic eye. If we remove the crystalline lens and replace its effect by adding to the refractive power of the cornea, the refractive power required to be so added is the strength of a convex lens correcting the hyperopia caused by rendering a previously emmetropic eye aphakic. After removal of the crystalline, the cornea would require to have a strength of 1000÷22.667, equal 44.12 D. 44.12 D.—32.26, the refraction of the normal cornea, equals 11.86 D., the hyperopia *measured at the cornea* produced by extraction of the crystalline from the emmetropic eye. To correct this hyperopia the lens placed at the ordinary distance of a lens in front of the eye would be a convex 10.5 D.

In contrast to the above, let us use the dioptric eye to ascertain the amount of previous myopia necessary for the removal of the crystalline lens to render the eye emmetropic. To give emmetropia after removal the retina must lie 31 mm. behind the cornea. To be focused upon the retina, rays must leave the crystalline converging towards the point 25 mm. behind the crystalline; that is 40 D. convergent. If they must be rendered 40 D. convergent by the crystalline and its refractive power is 20 D. they must have been $40-20=20$ D. convergent when they fell upon the crystalline. They must have been converging towards a point $1000\div 20=50$ mm. behind the crystalline, which will be $50+6=56$ mm. behind the cornea. Such rays must have left the cornea convergent $1000\div 56=17.86$ D. convergent. If they are rendered thus convergent by the cornea having a refractive power of 32.26 D., they must have been divergent on reaching the cornea, to the extent of $32.26-17.86=14.40$ D.; that is, the myopia before removal of the crystalline lens which would give an emmetropic eye after removal of the crystalline lens is 14.40 D. *as measured at the cornea.* Such a myopia would be corrected by concave lenses of 17. or 18. D. placed the ordinary distance in front of the cornea. This, then, is the amount of myopia as ordinarily measured and expressed, that can be corrected by removal of the crystalline.

The next problem of importance is the effect of removal of the crystalline on the size of the retinal image. This has been repeatedly worked out by previous writers on the subject. A sufficiently accurate approximation for practical purposes, may be reached by considering the effect of the increased length of the eyeball antero-posteriorly as compared with the reduced eye of Donders. In the emmetropic reduced eye the nodal point is 15 mm. in front of the retina. In the eye so myopic as to be rendered emmetropic by removal of the crystalline the nodal point is the same distance behind the cornea, and the increased length of the eyeball is to be added to 15 mm. to find its distance in front of the retina. The latter eye being 31 mm. long, as against 22⅔ mm., the length of the normal emmetropic eye, the difference of 8⅓ mm. is to be added to 15, making the distance from the retina to the nodal point 23⅓ mm. Since, for a given object at a fixed distance, the size of the retinal image, is directly proportioned to the distance of the retina from the nodal point, the linear dimensions of the retinal image of such a myopic eye, will be to those of the emmetropic eye as 23⅓ is to 15. The retinal image of the myopic eye will be 55 per cent. larger than that of the emmetropic eye. The correction of myopia by concave lenses placed at the anterior focus of the eye, the position usually assumed for the correcting lens, reduces the retinal image of the myopic eye to the size of the retinal image of the emmetropic eye. But the correction of myopia by removal of the crystalline, carrying the nodal point only from 7.321 to 7.829 behind the cornea, leaves the size of the retinal image practically unchanged. Hence, the gain in size of the retinal image by this latter means of correcting myopia is 55 per cent.; and this is about the improvement in visual acuteness that we can expect from a perfectly satisfactory removal of the crystalline lens, if the myopia is axial. If the myopia is myopia of curvature the gain will be less.

The ideal myopia, then, for correction by removal of the crystalline lens will be axial myopia, corrected by a concave lens of 17 or 18 D., and in such cases a perfect operative result should give 55 per cent. improvement of vision and escape from the need of wearing strong lenses. This may well carry the acuteness of vision, up from a point where a certain occupation is impossible, to a point where it is quite practicable. For patients who do only coarse manual labor the vision obtainable after removal of the crystalline without iridectomy, without any correcting lens, may be quite sufficient for their needs. Of course, accurate vision will usually still require correcting lenses, and different lenses for different distances.

One other point, the removal of the lens, rather than needling for absorption, has usually been practiced; and probably will continue to be. Even for patients young enough to make complete absorption by repeated needling possible, the long period required to accomplish absorption with safety will probably lead most surgeons to prefer removal. The incision for removal is sufficiently long to permanently alter, in most eyes, the curvature of the cornea. Therefore, it should be so placed as to tend to correct existing astigmatism or to utilize existing astigmatism to correct what it will cause. Despite Von Hippel's statistics, I believe that rather high astigmatism exists in a majority of cases of high myopia. Of course, after removal of the crystalline only the astigmatism of the cornea remains. Hence, the direction of the principal meridians of the cornea shown by the ophthalmometer, and not the direction of the principal meridians of the total astigmatism shown by the test lenses, are of practical importance in determining the location of the corneal incision.

CONCERNING CATARACT EXTRACTION — A REVIEW WITH COMMENTS.

BY G. E. DE SCHWEINITZ, M. D.

OF PHILADELPHIA.

The Corneal Section.—The disposition to make the incision exactly through the corneo-scleral junction, or through the transparent margin of the cornea, continues to be general, the height of the flap, or in other words, the extent of the corneal periphery which is included, varying according to the method of extraction which is adopted. It is generally conceded that for the proper expulsion of the lens in combined extraction, a flap embracing about one-fourth of the corneal periphery is sufficient. When the cataract is large, it is safer to include fully one-third of the corneal periphery. For the extraction of full-sized cataracts by the uncombined or simple method, the section may comprise nearly or even wholly the upper half of the cornea. Variations from these dimensions, however, are common, according to the experience and judgment of individual operators. Indeed, there can be no arbitrary rule —the probable size of the lens and the character of the cataract are the governing factors.

If, as Knapp has long advised, the knife remains in the same plane throughout, and the blade is turned neither forward nor backward at the completion of the section, a small *conjunctival flap* results, which is rather an advantage than otherwise. In Professor Snellen's operation the incision occupies half the circumference of the cornea, and lies in the apparent corneo-scleral margin. A large, broad conjunctival flap is made after the section of the corneo-scleral margin is completed. This conjunctival flap possesses several advantages: it conserves the vitality of the cornea, promotes healing, and prevents iris-prolapse. The procedure has been commended by Berry, Landolt and other operators, but, owing to the hemorrhage which sometimes follows the formation of conjunctival flaps, they have been condemned by so experienced an operator as J. A. White, of Richmond.

It will be remembered that the late Dr. Williams, of Boston, was accustomed to make a Lebrun incision, and to place a small suture in the apex of the flap. His son, Dr. C. H. Williams, after simple extraction, when a small conjunctival flap remains, places in the flap one to three sutures. A strong advocate of suture after extraction is Kalt, in France. The reviewer is impressed with the value of a conjunctival flap, and although he has not used sutures to close the wound after extraction, he has placed them with advantage after excision of a prolapsed iris.

Capsulotomy.—Differences of opinion in regard to the best method of performing capsulotomy continue. It would seem that peripheral capsulotomy, as practised by Knapp, possesses the greatest advantages, if it is understood that needling of the capsule later on is a necessary procedure—is, in other words, as Knapp has stated, the final stage of cataract extraction. An opening by means of a central crucial incision possesses disadvantages, but these are not present if the incisions are made in the form of a **T**. Excision of the centre of the capsule with forceps is usually reserved for those cases in which there is manifest thickening of this membrane. Nevertheless, as is well known, the routine practice of capsulotomy with forceps is advocated by many experienced operators.

Choice of Operation.—The disposition to perform "simple extraction" continues to be very general, or perhaps the procedure has found more universal favor, although now and then an operator of experience has decided to return to the "combined method." There seems, however, to be a greater tendency to select cases, or, rather, to separate those suited to the operation with iridectomy from those suited to the operation without excision of a piece of the iris. To be sure, the old fear of prolapse of the iris, which for a time was the chief objection to simple extraction, is passing away. Indeed, Berry has gone so far as to state that iris-prolapse, if the operation is performed after the manner of Snellen, need not be considered. He is, as are most surgeons, however, careful to make an iridectomy if the iris does not at once undergo easy, spontaneous replacement, or if it is not readily replaceable by the ordinary methods.

It is interesting to note the character of cases selected for the combined method of extraction. Thus, Berry excludes from simple extraction cases of hard, nuclear, black cataract in old people and of overripe cataract with capsular opacities and disease of the suspensory ligament; also cases in which there is a very shallow anterior chamber, and in which there is a foreign body in the lens, or in which there are iritic adhesions. So, too, he prefers combined extraction in nervous and unruly patients. In addition to the cases catalogued by Dr. Berry, the reviewer considers those in which the ball is hard, the lens large, the iris is not readily dilatable, or where there is ciliary irritation and the cataract is not yet ripe, more suited to the combined than to the simple method.

Now and then reports of an attempted revival of the extraction of cataract in the capsule appear. For example, Gradenigo after section ruptures the zonula through its entire length with a small hook and then delivers the opaque lens.

Iris-Prolapse.—With reference to the treatment of prolapse of the iris as a complication of simple extraction of cataract, a good many surgeons follow Knapp's advice to cut off the prolapse and reduce the edges of the iris if it is discovered within a few hours after its occurrence; if it is not seen early, to allow it to remain until the eye is quiet, when, if there is staphylomatous bulging, the protrusion may be abscised, or, in other words, treated as a staphyloma of the cornea.

The conservative treatment of iris-prolapse, even when discovered early, however, is gaining ground, as may be inferred from the recent communication on this subject by Dr. Robert L. Randolph, Dr. Joseph A. White, and others. Under suitable bandaging the prolapse flattens out and operative interference seems rarely indicated. In the discussion just referred to, the doubtful value of eserine in restoring a prolapsed iris was emphasized, because, as Dr. Randolph points out, it is apt to heighten the condition of irritation and does not seem to have much power in pulling the iris into place. Atropine, on the other hand, does not increase the hernia and lessens irritation. It is taken for granted that a compress bandage is applied during the treatment.

Ripening Operations.—While the belief of Dr. John E. Weeks, expressed two years ago, that, " it will not be long before the artificial methods of ripening cataracts will be entirely abandoned," may not yet have been realized, it is safe to state that the practice of ripening cataracts, whether by discission, Förster's method, or the Boerne Bettman, or the White-Pooley operation, appears not to have gained favor with the profession. If patients will not wait for nature's method of ripening, it seems preferable to extract the unripe lens, and, if necessary, deal with remnants by secondary discission. Indeed, Elschnig believes that all senile cataracts in patients over fifty are readily removable, whatever the condition of nucleus and cortex, and he is ready to extract as soon as vision becomes too poor to permit the patient to follow his ordinary vocation.

It is desirable that more information should be available with reference to the duration of treatment and the visual acuity after the extraction of unripe cataract. Statistics thus far published are quite as favorable as those relating to ripe cataract. This information is particularly needed on account of the frequent advertisements in the public prints of methods of absorbing cataracts employed by irregular practitioners. Patients naturally depressed by a period of semi-blindness are apt to be deluded by these advertisements into undergoing treatment, which, to put it mildly, is at least valueless.

Preliminary Iridectomy. From the very fact that preliminary iridectomy is usually recommended in cases where serious complications are apprehended, or where for any reason an extraction in one eye has terminated unfavorably, we may assume that there is a well-founded faith that this procedure improves the patient's chance of recovery. It would not be possible to discuss the advantages and disadvantages of preliminary iridectomy in this brief review, nor, indeed, is it necessary, as the whole subject has recently been considered very elaborately in the April number of the *Annals of Ophthalmology*, by Dr. W. Franklin Coleman who places himself on record, very decidedly, as believing that this is the safest method of extracting cataract, and one which should be commended to operators of limited experience.

After-Cataract (*Secondary Cataract*).—Except in rare instances in which the cataract is removed in the capsule, or in which a large piece of the anterior capsule has been removed with capsule forceps, sooner or later the division of the membrane is required if the highest type of visual success is to be obtained. Various modifications of the knife-needle continue to be used by most surgeons although a few, like Schweigger, have abandoned needles, or knife-needles of any description, and divide all so-called secondary cataracts with scissors introduced through a small wound made with a broad needle. Da Gama Pinto's very large experience with operations for the relief of secondary cataract indicates the value of a narrow Graefe cataract knife as an instrument for dividing the membrane. This surgeon, in addition to the ordinary operation of laceration of the capsule, has resorted to the so-called posterior discission in which the Graefe knife is passed through the sclera about eight millimetres behind the corneo-scleral junction. Recently Edward Jackson, arguing that the proper division of the membrane which remains after the extraction of cataract requires the longest possible sweep of the cutting edge of the instrument, advocates the entrance of the knife-needle through the limbus. He also believes that this method lessens the chance of infection. The writer uses Knapp's knife-needle with entire satisfaction; sometimes, when the membrane is thick, he has practised with a modified Hays knife-needle the so-called V-shaped iridotomy, as described by Dr. Lewis Ziegler, of Philadelphia.

Antisepsis.—The ordinary methods of sterilization of instruments have not been greatly modified, and boiling water continues to hold its very proper pre-eminent place. It is possible that the recent suggestion made by E. A. de Schweinitz, of Washington, to utilize the vapor of formaldehyde for the purpose of sterilizing ophthalmic instruments, will prove to be valuable. Certainly the method would be a most convenient one.

It is so well known that neither irrigation nor the instillation of germicides produces sterility of the conjunctiva, that surgeons should strive, and do strive, to quote Knapp, to change the conjunctiva, if irritated or congested, into a pale, shining membrane by the simplest regimen. This regimen means that for some days preceding the operation the eye should be protected from anything which may produce hyperemia of the conjunctival vessels, because, as Randolph has expressed it, bacteria ordinarily non-pathogenic (and the normal conjunctiva always contains bacteria), may become harmful under certain favoring conditions, such as bruising the tissues by instruments, or irritating them with chemical substances. Whether all surgeons would be willing to follow Randolph in his advice to abandon conjunctival irrigation entirely, is doubtful. Flushing the conjunctival cul-de-sac with a non-irritating fluid like sterilized salt solution immediately preceding the operation, can at least do no harm in the sense of bruising the tissues, and may wash away irritating and contaminating secretions, and even, as has been experimentally shown, reduce the number and perhaps the vitality of the organisms which are present.

The evident conclusion of the matter is that strong germicidal solutions should not be used in the conjunctival cul-de-sac immediately preceding a cataract extraction, or after the corneal section, and to quote Randolph once more, in operating upon the normal conjunctiva, as in cataract extraction, the surgeon would do well to consider the subject of antisepsis and asepsis chiefly in connection with hands, instruments, cocaine and atropine. When the conjunctiva is not normal, as, for example, in cases of chronic conjunctivitis, lachrymal conjunctivitis associated with disease of the tear passages, blepharo-conjunctivitis, etc., methods of antisepsis necessarily must be more vigorous, or, rather operation must be deferred until the affected areas are brought into a reasonable state of health. It seems to the writer very essential in all of these cases to pay strict attention to the preliminary treatment of the rhinopharynx, from which, no doubt, many cases of infection have arisen.

EXTENSIVE LACERATION OF THE EYE BALL—RECOVERY WITH GOOD VISION—COMMENTS.

BY F. B. EATON, M. D.

SAN JOSÉ, CAL.

Illustrated.

The unusual amount of vision preserved in an eye which after injury was apparently demolished, and the surgical features of the treatment along some lines contrary to the conventional teachings of the text books, seem to warrant a report of the following case:

S. W. P., æt. 20, a blacksmith, was sent to me by his family physician, April 30, 1897. An hour before a piece of hot horse-shoe struck the left eye. It is shown in Figure 1 full size. The lower lid was slightly burned, and there was a wound of the globe extending from the center of the cornea downward and outward to include ¾-inch of the sclerotic. The wound gaped widely to the extent of about $\frac{3}{16}$ inch, and his companion stated that a large amount of "jelly-like stuff" had escaped; this extensive loss of vitreous was plainly shown bythe flaccid collapsed condition of the globe. A large portion of the iris, torn loose from the ciliary body, lay in the corneal wound. The lens was not visible.

According to traditional clinical rules this appeared to be a case for prompt enucleation, and my first impulse was to resort to it; but on second thought, as the piece of iron was very hot when it struck the eye, and so presumably aseptic, while the patient was temperate, young and healthy, I decided to attempt, at least, to save the eye-ball. Dr. Gordon, who saw the case with me, concurring. The conjunctival sac and parts about the eye were carefully cleansed, and under strict asepsis two fine sterilized silk sutures were inserted through the sclerotic, one at the junction of the middle and outer thirds of the wound, and the other close to the corneal limbus. The corneal wound still gaped, and the torn and prolapsed iris was carefully cut away. To bring the edges of the corneal wound together I next dissected up the conjunctiva for a distance of a third of an inch from the cornea, and with silk sutures brought the conjunctiva together so as to close the whole corneal wound.

An unfavorable prognosis was given, as about one-half of the vitreous was lost. However, on examining the eye on the third day there were no signs of reaction, and on the fifth day the wound was united throughout, there was no iritis, and there had been no pain; but an unfavorable prognosis was still given, as the lens was believed to have been dislocated backward, and the loss of

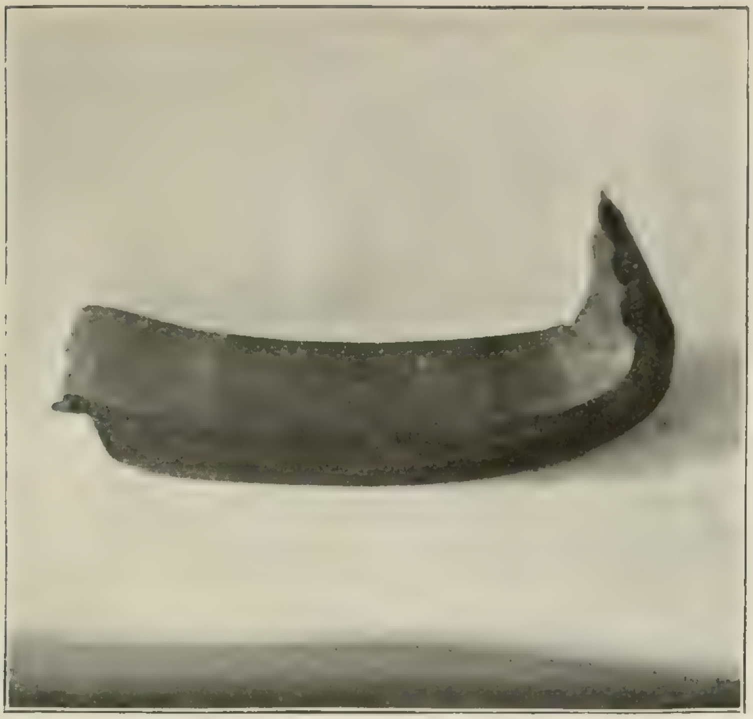

Figure I.

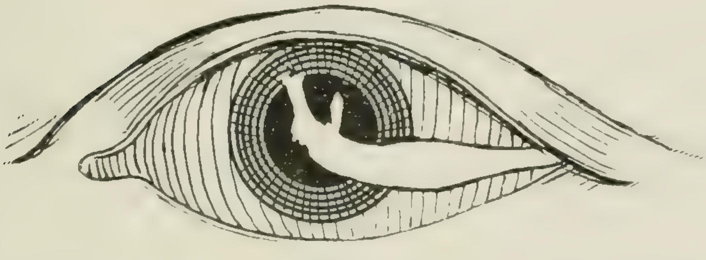

Figure II.

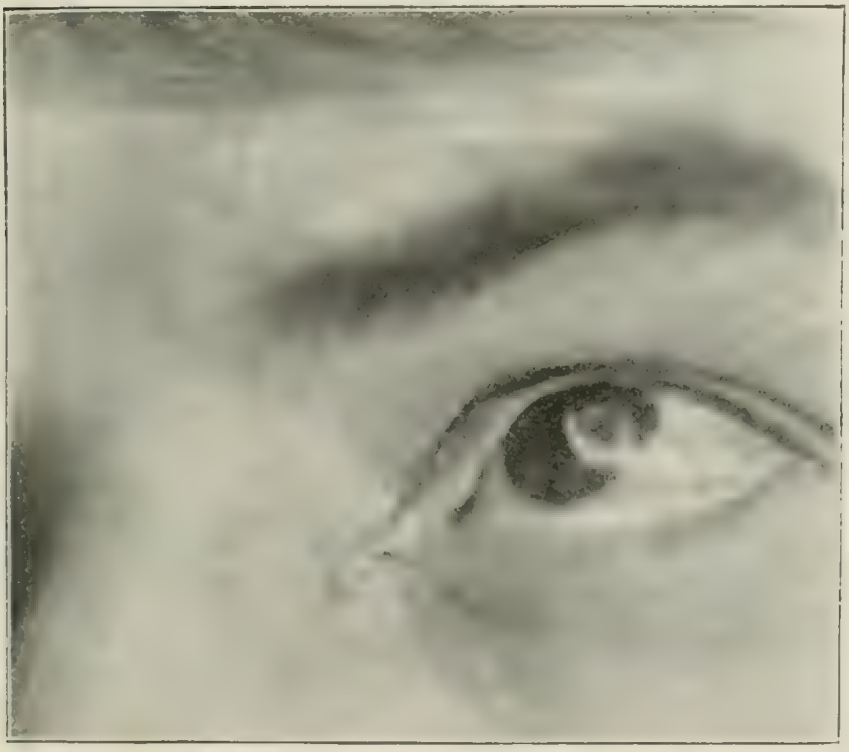

Figure III.

F. B. Eaton's Article on Extensive Laceration of Eyeball, etc.

vitreous so great. Atropine was used, and the pupil fully dilated; conjunctival sutures removed.

Seventh day—marked ciliary injection; no lens visible by oblique illumination; no prolapse of iris or ciliary body.

Tenth day—the suture on the corneal limbus came away.

From this time the case progressed rapidly on to recovery, and on the twenty-second day the injection had faded out. The examination showed an anterior synechia and double pupil; the false pupil being at the outer periphery of the iris. Tension normal.

Six weeks after the accident $V = \frac{20}{200}$ and with $+ 3.00^{s} \supset - 6.00$ cyl. axis 15^{s} $V \supset \frac{20}{80}$.

On recent examination, December 8th, the eye appears as in Fig. 3; is free from all irritation or tenderness; tension normal; with $+ 1.25^{s} \supset - 4.50$ cyl. axis 180° $V = \frac{20}{40}$; and with $+ 4.00.^{s} \supset + 4.00$ cyl. axis 90, reads Jaeger No. 4 at eight inches; no accommodation. Iris of normal color; no retraction of scleral cicatrix. By oblique illumination the cornea is seen to be clear except at cicatrix. The lens is absent, but a concaved membrane, evidently the capsule, occupies the position of the posterior capsule. By the ophthalmoscope this membrane is seen to be thrown into folds which converge toward the anterior synechia near the inner limbus. Vitreous clear. Retinal vessels only visible here and there through the distorted cornea and capsule. Refraction at the macula $+ 2.00^{s}. \supset - 4.50$ cyl., axis 180. Fig. 3 is a fair representation of the appearance of the eye as is possible by photography.

Remarks. With the exception of traumatic cataract, the injury presented every unfavorable feature possible; involving the cornea, expulsion of the lens, laceration of the ciliary body, extensive laceration of all three coats of the globe, and great loss of vitreous. Such laceration of the ciliary body alone, was, until of late years, considered sufficient indication for immediate enucleation, and yet one suture was passed through it apparently without detriment. As Buller of Montreal has pointed out: * "It is quite generally conceded, though recently denied by some ophthalmic surgeons, that wounds involving the ciliary region to any considerable extent are especially liable to be followed by sympathetic ophthalmia; and this part of the eye has received the ominous name of 'dangerous zone.' Antiseptic surgery has, however, certainly done much to diminish the supposed danger of wounds in this region."

Knapp has lately reported a case in some respects similar to the one here recorded. An exploding bottle inflicted a perforating wound in the upper part of the sclera, extending from near the equator of the globe on the temporal side obliquely forward into the ciliary region on the nasal side. Wound gaped and was filled with vitreous on the nasal and with

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*Hare's System of Practical Therap., Vol. III, p. 1189.
Archives of Oph., Vol. XXVI, No. 1.

ciliary processes on the temporal side. Lens and iris uninjured; sight preserved. The eye was kept closed with a compressive bandage, and the patient kept in bed for three weeks. No inflammation occurring, the only other treatment was a drop of atropine now and then, and the temporal two-thirds of the wound cicatrized, but the nasal portion, where the ciliary processes protruded, developed into an oblong cyst projecting 2 — 3mm. above the surface of the sclerotic; this was exsected by Knapp, and the edges of the scleral wound pared. Wound was not sutured, but left to unite under a simple compressive bandage. The eye made a good recovery, but with considerable astigmatism, and a dilated, immovable pupil. Nevertheless the result is surely a notable illustration of the value of conservative surgery in cases of extensive scleral wounds.

In the case here reported the paste-board eye shield of Dr. Harold Gifford was of invaluable service, as it has been in many cases of eye wound.

Porter Building.

AN IMPROVEMENT IN ILLUMINATING THE OPHTHALMOMETER.

BY WILLIAM E. BAXTER, M.D.

OF BOSTON, MASS.

After much experimenting with lights in various positions, with the view of finding a simpler method of illuminating the mires of the ophthalmometer, the writer has arrived at the following method, that for effectiveness and simplicity leaves little to be desired.

The method consists of fastening a sixteen candle-power electric lamp to the front of the arc, under the telescope and parallel to it,— the small frosted sixteen candle-power lamp, known to the trade as the "baby," is the most convenient — the lamp must be set on an insulated base. With the lamp in this position the mires are perfectly illuminated, and as the lamp revolves with the arc the illumination is the same in all positions. This enables one to do away with the large dial of the earlier instruments, the chief use of which was to furnish protection to the eyes of the surgeon, and makes a more compact and neater instrument. The light is shaded from the patient's eyes by means of a metal disc of six or seven centimeters in diameter, suspended from the end of the telescope in front of the lamp.

Another improvement of the instrument is to use white porcelain plates having the steps painted black, on the ground side, as this gives a much better surface for reflection than the enameled metal mires. These porcelain plates can be easily added to any instrument by cutting off the mires from the slides, and fastening the plates by means of clamps to the slides.

553 Boylston street.

EXTRA FRONTS—SOME SUGGESTIONS.

BY G. H. WHITCOMB, M.D.
OF GREENWICH, N. Y.

When the unfortunate wearer of spectacles for any form of ametropia is obliged to put on a presbyopic correction, there presents a problem; and the question of what to wear for near work and reading becomes perplexing. Two pairs of glasses are the most satisfactory in results, but troublesome in use. Bi-focal lenses of any kind are not tolerated by most people; and fewer still have the nasal contour to carry eye-glasses before their ordinary correction. Extra fronts scratch and blur the lenses before which they are worn; the hooks get bent, requiring to be corrected before they can be adjusted in place; and they are frequently lost. Yet, on the whole, it seems to me that the most satisfactory solution of the problem will be by the use of the extra fronts, providing that the difficulties mentioned can be surmounted; and to that end I desire to offer some suggestions, viz.—

First:—The frames should have bridge and hooks made more rigid than at present. The eye should be the pulpit or half eye; and the end-pieces should be so adjusted as to allow the fronts to rest as low as the spectacles before which they are worn.

Second:—To secure lightness of weight the lenses should be ground on blanks no thicker than necessary to get the required focus, and the posterior or concave surface should correspond with that of the lens before which it is to be worn. In high grades of myopia where bi-concave lenses of much thickness are used, it may be necessary to set them in their frames in a manner like the fronts, except that they should be set well back of the eye wire. The optical should correspond with the geographical centers in the perpendicular meridian, and in the horizontal decentered inward by 2 to 4 mm.

Third:—Safety, portability, and convenience may be secured by having a small thin case made of thin tempered steel, covered with leather, and lined with long pile plush to keep the fronts from falling out. The upper end should be open and cut away in front as in the ordinary variety now in use; and be provided with a stud just below the opening to button through the facing of the vest pocket to hold the case securely. A flap may be provided if found by experience to be desirable, to cover the top by buttoning over the stud. This could be readily carried by ladies, or the cord, or chain with hook, as used for eyeglasses, will answer admirably.

The same principles of construction may well be applied to eye-glass cases and those for straight temple frames.

I have found that the common periscopic lenses, set in the ordinary frames after the manner described above very satisfactory indeed; and believe that when the suggested improvements are secured, that the extra front will fill a large place in our prescriptions for presbyopic correction in ametropes.

TRIAL FRAME FOR INTERCHANGEABLE LENSES.

JOHN C. LESTER, A.M., M.D.

Fellow of the American Laryngological, Rhinological and Otological Society; Fellow of the American Academy of Medicine; Assistant Surgeon of the New York Eye and Ear Infirmary; Assistant Surgeon to the St. Bartholomew's Clinic for the Eye, Ear, Throat and Nose; Member of the Medical Society of the County of King, etc.

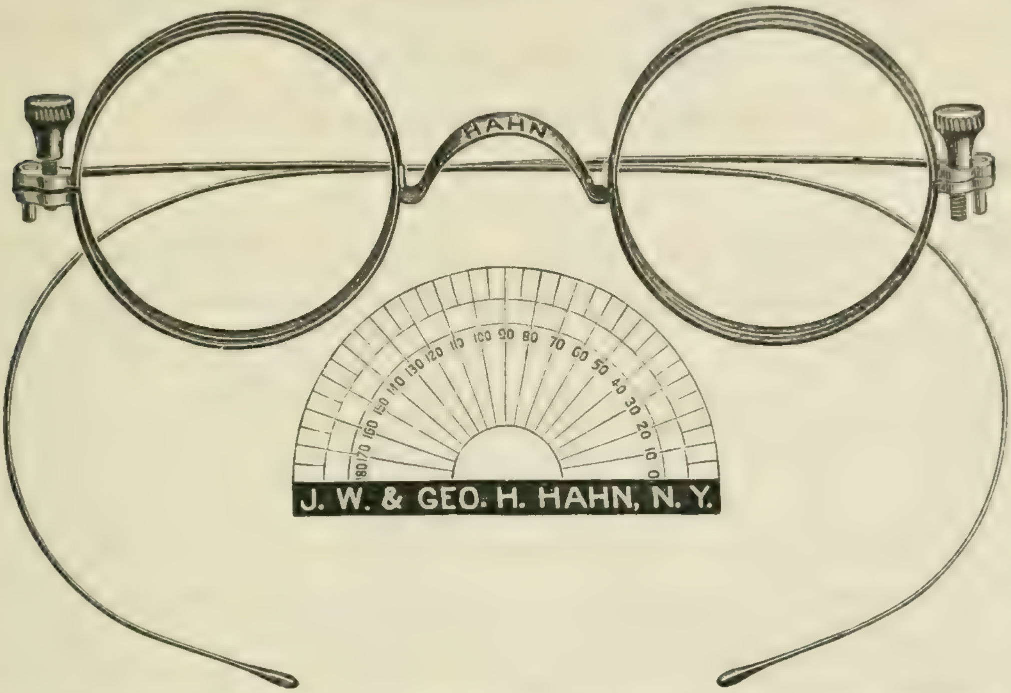
OF BROOKLYN, N.Y.

Illustrated.

No ophthalmologist has failed, from time to time, to experience the necessity of a trial frame adapted, by weight, size and appearance, to a more or less extended use by the patient. Cases of mixed astigmatism, anisometropia, antimetropia and presbyopia, present such a variety of problems, that even those most experienced in the correction of errors of refraction are often at a loss to know exactly what correction will be accepted by the patient, and worn with comfort. These are the cases usually of the neurotic type, which "harrow up the soul" of the super-sensitive ophthalmologist, until, in utter despair, he becomes a veritable "calamity howler" and divines the future estate of the so-called "refracting optician" and himself to be one and the same.

To eliminate, as far as possible, this element of speculation and uncertainty as to the lenses which will be worn with comfort by the patient, the writer has devised a double, adjustable frame, adapted to a set of small lenses of selected strengths, which can be worn indefinitely.

It will be seen that by means of this double trial frame, any number of combinations can be made between cylindrical and spherical glasses. Prisms can also be added, either in the shape of a lorgnette attachment, or in combination with the spherical or cylindrical correction. By means of a thumb screw at either end of the frame, as seen in the illustration, the interchange of lenses can be instantly accomplished.



The delicacy of the rims not admitting of the various axes being indicated on the frame, a protractor has been added for convenience and accuracy. Messrs. Hahn of New York City, have carefully executed every detail in the manufacture of the frames, lenses and protractors. In the hands of the writer, this temporary trial frame has proven of value in any case where there was an element of doubt which could only be removed by an actual and more or less continued use by the patient of the correction decided upon.

179 Schermerhorn street.

PROPER PREPARATION OF THE YELLOW OXIDE OF MERCURY OINTMENT.

BY T. E. MITCHELL, M.D.

Member of the American Medical Association and the Medical Association of Georgia.

OF COLUMBUS, GA.

Referring to the very valuable suggestions of Drs. Babcock and Keiper, in the August and September numbers respectively of the RECORD, in regard to the proper way of preparing the yellow-oxide-of-mercury ointment for use in ophthalmological practice, I desire to say that, no matter how much time and care are consumed in mixing the powder and the vaseline if no other agent is added, minute particles of the mercury will remain and hence defeat the desire to have it uniformly distributed throughout the vehicle. This obstacle can be easily overcome by observing the following instructions in the preparation of this time-honored and valuable therapeutic agent: To the required amount of powder in an impalpable form on a clean glass or porcelain slab add a few drops of any bland non-irritating fixed oil and mix well with a clean spatula; to this slowly add the necessary petrolatum and, for reasons well known to chemical law the powder is so far reduced by the oil as that it is evenly incorporated in the vaseline.

The following prescription which is a favorite one with me, in the hands of a competent pharmacist will be entirely satisfactory :

℞
Olei Ricini.........gtt iv
Hydrg. Oxid. Flav..gr iij
M et ad
Petrolati ....ʒij–iv
M ft Ungt.

Of course the ointment after all is only a mixture but the mass is so thoroughly homogeneous that not until it is kept for a long while will the mercury if at all, gravitate to the bottom.

I am indebted for the above information to my prescriptionist, Dr. J. P. Turner, ex-president of the Georgia Pharmaceutical Association, and member of the Georgia State Board of Pharmacy.

TWO UNUSUAL CASES OF STRABISMUS.

BY F. W. MARLOW, M.D.,
Professor of Ophthalmology in the University of Syracuse, N. Y.
OF SYRACUSE, N. Y.

Illustrated.

Case 1. Divergence Following Tenotomies Performed in Infancy—Establishment of Binocular Single Vision at the Age of Eighteen Years—Case Perhaps Originally One of Double Vertical Strabismus.

Mr. C. W. P., aged 18 years, a native of Connecticut, was referred to me on February 1, 1892, by Dr. A. C. Benedict, of this city.

At the age of three weeks he was noticed to be crosseyed, and this condition grew much worse after an illness which shortly supervened; at fifteen months both eyes were operated upon, divergence resulting. There seems little doubt from the father's statement that the squint was originally of the alternating variety. He has never seen double, but is conscious that when he looks at an object moving across the field of vision that the eyes "jump," but there is no corresponding alteration in the apparent position of the object.

A year ago, glasses were prescribed for him on account of some asthenopia. He suffers from some aching of the eyes, especially since an attack of facial paralysis (left side) last November, the effect of which has not yet completely passed off. The use of the eyes for near work seems to have no effect on the aching. Some temporal headache. He usually uses the right eye for looking steadily at anything.

Present condition, February 1, 1892:

$$\text{R. V. } \tfrac{6}{6} \text{ partly } \left.\begin{array}{l} +\ 0.75 \text{ sph.} \\ +\ 0.25 \text{ cyl. } 5^\circ \end{array}\right\} \text{ Slight improvement.}$$

Globe slightly prominent, inward movement very defective, so that the inner margin of the cornea remains well outside the lachrymal papilla.

$$\text{L. V. } \tfrac{6}{12} \begin{array}{l} +\ 0.75 \text{ sph.} \\ +\ 0.25 \text{ cyl. } 90^\circ \end{array} = \tfrac{6}{9}$$

Marked divergence of this eye, which moves in well, the inner margin of the cornea coinciding with the inner canthus. Cannot close the lids perfectly.

February 2. Homatropine:

$$\text{R. } \tfrac{6}{18} + \text{ with } \left.\begin{array}{l} +\ 1.25 \text{ sph.} \\ +\ 0.25 \text{ cyl. } 180^\circ \end{array}\right\} = \tfrac{6}{6}$$

$$\text{L. } \tfrac{6}{18} \left.\begin{array}{l} +\ 1 \text{ sph.} \\ +\ 0.25 \text{ cyl. } 90^\circ \end{array}\right\} = \tfrac{6}{6} \text{ about as well as with R.}$$

Fixes usually with R. eye, but sometimes with L. Probably uses R. for right portion of the field, L. for the left portion. When a red glass is placed in front of the R., and a green one in front of L., and a lighted candle moved from right to left across the field of vision, the flame appears red until the middle line has been passed 10° or 12°, he is conscious that the eyes jump, and the flame suddenly becomes green without any change in its position. When the candle is brought into view from the left, its color is green, and changes to red suddenly after passing the median line, but nearer to it than in the former case, in spite of the fact that the inward movement of the left eye is far more perfect than that of the right. Will not admit diplopia with or without colored glasses, until prisms = 18° (9° each) are placed base in before eyes; then there is homonymous diplopia, the images being about level and near together.

February 12. With red and green glasses and very carefully adjusted prisms (= 20°) to produce homonymous diplopia, about 5° of R. hyperphoria (or hypertropia) can be demonstrated. On removing colored glasses, the prisms (with a 5° prism to correct vertical error) remaining in position, the images coalesce; on removing the vertical prism, there is temporary diplopia, the two images soon uniting again. If while looking through the lateral prisms the R. eye is covered, it moves upward markedly, and on removing cover to L., the R. moves down again to fix. Similarly L. moves down and up, but to a very slight extent compared with the right.

February 13. With R. pr. 5° base down and 6° base in before each eye, gets binocular single vision. Diplopia is always homonymous whatever prisms are used.

The accompanying photographs show the position of the eyes during fixation, No. 1 with the left eye, No. 2 with the right eye.

The photographs were all taken in the same manner, the *patient sitting directly in front of a window, and fixing the lens of the camera, which was placed directly in line with the patient and window.* A comparison of the relation of the corneal reflection of the window to each pupil shows therefore with the greatest possible accuracy the relative position of the eyes. Attention should be called to the fact that on account of the facial paralysis, the left lower lid occupies a position a little lower than normal. This makes the left eye appear to be a little higher than it really is. A careful comparison of the reflections will correct this impression.

Feb. 14. *Partial tenotomy of R. superior rectus,* leaving images about on a level, but a little uncertain on account of the blurring produced by cocain; only extreme marginal fibres left uncut.

Feb. 15. Image level, but vary a little. R. sometimes a little too high, and sometimes a little too low. On covering first one and then the other eye the movement for fixation seems entirely in the horizontal plane. The right, perhaps, deviates a very little upwards when covered. Its inward movement is decidedly fuller than before, whereas before the inner margin of the cornea could not be brought as far in as the lachrymal papilla, it can now be brought well within it. The patient also volunteers the statement that he can move the eye further in than before the operation. Prisms 3° base in over each eye now give binocular fixation, as demonstrated by cover test.

Photograph 3 represents the appearance of the eyes at this time. This and the two preceding ones were taken in front of a bay window, consisting of three lights. The reflections of the three separate windows can be easily seen with a magnifying glass, and it is, of course, the lower part of the middle one which corresponds with the visual axis of the fixing eye. If the left eye in the photograph be compared with the left eye of photograph No. 2, a remarkable change in the relation of the reflection to the pupil will be found. In No. 2 the images of two of the windows lie upon the inner limb of the iris, in No. 3 the reflections of the images of all three windows lie within the pupil. In this photograph the position of the images correspond so nearly in the two eyes that it is hard to resist the conclusion that he was fixing the camera with both at the time the exposure was made.

Feb. 16. When L. is fixing, R. certainly appears the higher, but when R. is fixing, L. also appears a little higher than R.

Measurement on perimeter, shows 12° of divergence of R., left fixing.

Measurement on perimeter, shows 20° of divergence of L., right fixing.

Feb. 17. Phorometer (Stevens) and colored glasses shows R. hyperphoria not more than 2°.

* With stereoscope sees L. F. most of time separately, but occasionally combines into E. for moment.

Feb. 21. *Tenotomy of L. inferior rectus*, dividing all but extreme marginal fibres.

Feb. 27. Does not admit any hyperphoria by phorometer, etc., but R. looks higher when excluded, and L. fixes; is certainly able to fix distant candle with both at same time.

Feb. 28. *Advancement of the middle portion of R. internus* by a single suture. A good deal of thickened tissue at site of original attachment. New attachment very irregular and diffuse—tendon small and thin. Effect of operation well marked.

Feb. 29. Eyes look quite straight; volunteers statement that he can use both at same time.

March 1. Says he can look at anything more easily with the two together than with either separately. Undoubtedly has binocular fixation for distant objects, and even up to two feet (not tested nearer); by covering eyes with red and green glasses, candle flame partly red and partly green is seen, and other tests show binocular fixation, but with stereoscope does not unite the two images.† Occasional homonymous diplopia.

March 2. Usually fixes with both. When asked to fix with R. only, makes movements of L. lids, and L. eye deviates *upward and outward*. When asked to fix with L. the R. deviates *upward and outward*.

Photograph No. 4, taken 8 days after the first readjustment shows the usual position of the eyes at this time.

March 12. Occasional marked manifest divergence, but it is usually latent.

March 13. *Partial tenotomy of R. externus*, leaving extreme marginal fibres.

March 27. Some latent divergence still remained, and on account of there remaining some defective movement inward of the R. eye, a *further readjustment of the R. internus* was made.

March 30. Patient has complained of vision being blurred since the operation $V=\frac{6}{24}\begin{smallmatrix}-0.25\text{ sph.}\\+2.5\text{ cyl. ax.}\end{smallmatrix}40^\circ=\frac{6}{6}$ptly: due to visible distortion of cornea (flattening at inner margin) by the tension of the suture.

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*This was the only occasion at this period on which he succeeded in combining the two images.

†This was doubtless due to the fact that the two portions of the stereoscopic picture used at this time were too widely separated.

March 31. Blur remains, suture removed, vision being immediately restored, but part of the effect of readjustment lost.

On April 3d, there being still some latent divergence, a *readjustment of the L. internus* was made, and a *partial tenotomy of L. externus.*

April 4. ? Slight latent convergence.

April 8. Phorometer shows homonymous diplopia, requiring prs. = 20° bases out to reverse it. R. when covered moves upward. L. when covered moves upward ? as much as R. According to phorometer there is R. hyperphoria 1°.

I have seen this patient as recently as December, 1897, and photograph number 5 was taken then. It shows the eyes to be perfectly straight, and also that the facial paralysis has completely passed away, as indicated by the normal position of the left lower lid. He has had but little asthenopia, and still wears the glasses prescribed 5½ years ago.

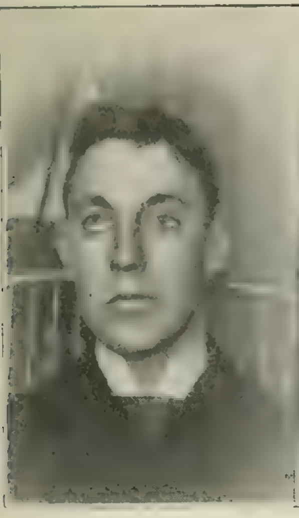
If either eye is covered, it at once deviates upward; and it seems probable from the statement of the patient that very occasionally the left eye deviates up temporarily.

He has binocular single vision as shown by the stereoscope with Kroll's orthoptic exercise plates, but the two images are more easily united when they are brought nearer together. I have no doubt that had the same plates, or plates with the same distance between the corresponding points of the two pictures, been used immediately after the first readjustment operation, that stereoscopic vision would have been shown then, for in all other respects the evidences of binocular fixation were as clear and definite at that time as at present.

There seems to be but little doubt that the binocular function has been in abeyance since the onset of convergent strabismus at the age of three weeks, which is probably equivalent to saying that it never existed; and the condition of the visual fields, or rather the projection of images formed for about 5° to the outer side of the yellow spots upon the outer portion of the F. of V., would indicate that this portion of the retina has received images from the outer portion of the F. from a very early age, and that, therefore, the immediate, or at any rate early, effect of the tenotomies was divergence.

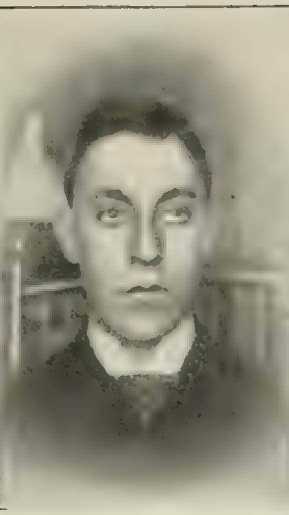
In view of the facts that binocular vision had never existed, or at any rate had not been exercised to any extent, and that the visual axes had become displaced by operations, so as to cause the establishment of false relations between the retinæ and the fields of vision, is it not surprising that the binocular function should have been assumed promptly and without inconvenience as soon as the eyes were brought upon a horizontal plane, and readjustment of the internus had been made?

One of the most striking incidents of the case, was the marked diminu-



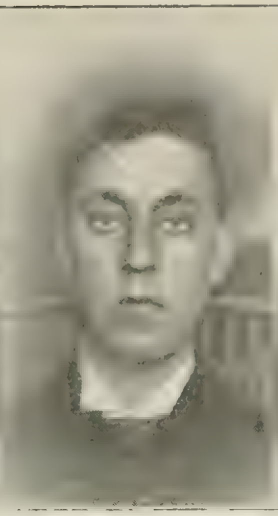
1

Fixing with left.



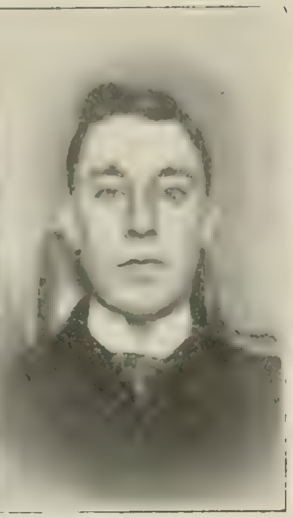
2

Fixing with right.



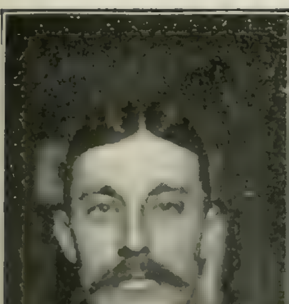
3

After partial tenotomies of right superior and left inferior recti.



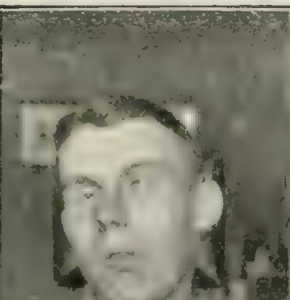
4

After advancement of middle plies of right internus with one stitch.



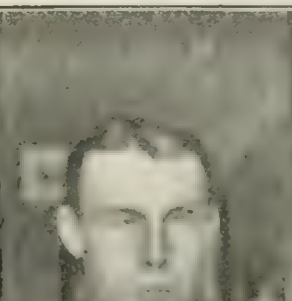
5

Four years later.



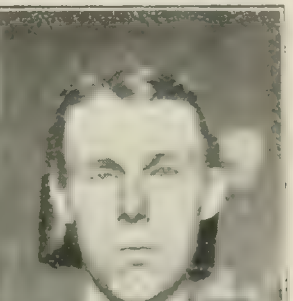
6

Position of head necessary to fix with right eye.



7

Position of head necessary to fix with left eye.



8

Primary result.

tion of divergence, and the even more definite increase of inward movement which followed the partial tenotomy of the R. superior rectus, strongly comfirming the correctness of Stevens's advice not to interfere with the lateral muscles until all vertical deviation has been corrected. A phenomenon calling for remark is the symmetrical vertical deviation, occurring in either eye when excluded from the visual act.

Before operation, with the left eye fixing, the right eye was turned out and decidedly up, but when the right fixed, the deviation of the left eye was purely outward. It was sometimes thought that there was a slight downward deviation, but this was never quite satisfactorily established, and the faulty position of the lower lid, due to paralysis of the orbicularis, added to the difficulty of deciding the point.

After the right hyperphoria had been corrected, each eye when covered deviated upward, and to practically the same extent.

It has been often observed that in cases of old standing divergent strabismus, the diverging eye is also displaced a little upwards, and it has been suggested by some one, whose name I cannot recall, that this upward movement is an adaptive movement, the object of which is to place the pupil under the upper lid and so exclude the false image.

In this case the adaptive movement was complicated by the presence of R. hyperphoria (or left hypophoria). In the right eye the vertical deviation was made up of two elements, the hyperphoria and the so-called "adaptive movement," resulting in a very decided displacement of the eye upward. In the left eye the upward adaptive movement was neutralized by the hypophoria, leaving the eye on a horizontal plane with the fixing eye.

The hyperphoria having been corrected, the adapted vertical displacement became about equal on the two sides.

The greater portion of the preceding report was written three or four years ago, before the publication of Stevens's papers on "Double Vertical Strabismus" in the Annales D'Oculistique in 1895.

The "adaptive movement" above referred to is doubtless an example of that form of double vertical strabismus to which Stevens gives the name anotropia. The case then would seem to have been originally one of anotropia and R. hyperphoria.

I have no doubt that the most important element in the treatment of it was the correction of the hyperphoria.

Case 2. Convergent Strabismus Due to Traumatic Paralysis of Both Sixth Nerves During Infancy—Correction by Operation.

A. Y.—Boy ætas 16 years, was brought to me on May 22, 1895, because he was cross-eyed. The peculiar sudden shifting movements of the head which he made in looking about immediately suggested that the case was not one of ordinary concomitant strabismus, and examination soon showed that it was one of complete paralysis of both sixth nerves.

The history given was that at the age of 18 months, while tied in a rocking chair, he fell forward, striking his forehead against the ground. The crossing of the eyes is said to have come on gradually after this. The source of information is of doubtful reliability.

Examination showed both eyes convergent, and the right turned a little down. Neither eye can be rotated out to the median line, so that in order to fix an object placed exactly in the middle line, and at a distance greater than about 12 or 13 inches, the head has to be rotated to one or the other side, according to the eye chosen for fixation. Movement in all other directions is good. With a red glass before either eye there is homonymous diplopia.

Photograph No. 6 shows the position of head assumed when he fixed the lens of the camera with the right eye.

Photograph No. 7 shows him fixing the camera with the left eye.

There is a history of very prolonged ophthalmia in early life, and focal illumination shows the presence of nebulæ on both corneæ, the right being more damaged than the left. These facts doubtless account for the narrowing of the right palpebral fissure.

On June 9th. Under cocaine a thick silk thread was passed through the conjunctiva at the outer margin of the right cornea. By pulling on this thread the eye was rotated a little outward, and fixed thus by tying the thread around the right ear. The tendon of the internus was then detached from the sclera, and as much of it as could be reached cut off with scissors. The muscle was rigidly contracted, making the tenotomy and excision somewhat difficult. The eyeball was fixed by means of the suture in a straight position. The suture was removed on the fourth day.

June 15th. No lateral movement. Patient says right now stronger than left.

June 17th. Similar operation on left.

June 24th. Can use eyes much more easily than before operation.

Photograph No. 8, taken in same manner as those in preceding case, shows the image of the window in the center of each pupil.

A year later the appearance of the eyes still better, on account of increase in the width of the right palpebral fissure. The eyes looked perfectly straight, and without specific examination of the lateral movements, nothing could be observed wrong with them. Lateral movement was not completely abolished, but amounted to not more than 4° or 5°.

TROPHO-NEUROTIC KERATITIS.

BY K. K. WHEELOCK, M.D.,

OF FORT WAYNE, IND.

My attention was first called to this class of cases in March, 1887, when A. F. K., aged 55, a farmer by occupation and German by birth, consulted me with an attack of herpes zoster ophthalmicus of the right eye.

The following condition was present:

A large ulcer on the cornea at the upper-inner segment, with a shallow excavation. Patient complained of a cold sensation in his eyeball, as though the eye were a ball of ice. Anterior chamber was one-quarter filled with pus and the iris bound down to the capsule of lens, leaving the pupil the size of a pin-head. Patient was a strong, healthy man, but his sufferings had greatly reduced him. The ulcerative area had extended at the second visit. The entire cornea was anesthetic. With the use of faradization the sensibility of the cornea returned. At the next visit the corneal sensation was again diminished, and faradization was again employed. After the fourth faradization, sensation remained in nearly normal state. Current had been applied from five to seven minutes over closed lids. There seemed to be no difference which pole was applied to neck. When sensation began to return to cornea, the ulcer began to diminish in extent and depth. Ulcer did not penetrate into anterior chamber, and got well with an eschar.

Three points in this case impressed my mind: First, the diagnostic significance of corneal sensibility; second, the value of faradization in such cases as presented subnormal corneal sensation; third, the pathology of herpes zoster ophthalmicus centering in the Gasserian ganglion. After this I gave much attention to testing corneal sensibility.

In January, 1889, Charles F. K., aged 39, German, machinist, was referred to me by Dr. M. F. Porter, of Fort Wayne, with the statement that patient had gotten particles of sand in his right eye while at work. The notable features were slight lachrymation, very slight photophobia; but no pain — simply a sense of irritation. Inspection showed a scarcely perceptible injection at sclero-corneal junction; no foreign body on cornea or conjunctival surface. The upper outer segment of cornea was roughened as though it had been picked in many places with a minute sharp needle. The statement of the physician, that the eye looked as if it had received a "sand blast" could be readily credited, but there was no history to indicate such an accident. I treated the cornea with a spill of cotton,

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*Read before the Chicago Ophthalmological and Otological Society December, 1897.

twisted hard, and found it practically insensible over the area of roughening, but with the unaffected five-sixths of the cornea the sensibility was noticeable, though very much reduced, the reflex being lost. T—; pupil contracted. Treatment continued about one month.

On February 19th notes show that corneal reflex had returned; T minus two and roughened area was smaller in extent and less marked in point of apparent roughness. Treatment had been strychnia, quinine, arsenic and electricity, systematically administered, while locally the usual cleansing solutions were applied. On June 23, 1893, Dr. T. J. Dills, then my partner, enucleated the eye here submitted.

December 4th, 1895, Henry L., aged 55, farmer by occupation, German by birth, consulted me with the following history: Four weeks before, while hauling corn fodder from the field, the wind carried something into his left eye. Had some pain at the time, and rubbed his eye, and for further relief used chamomile poultices, which relieved him of the severe pain. He had suffered from occasional attacks of neuralgia in the head for years, the last attack having been preceded by a chill; but there was no return of the chill. Never suffered from digestive disturbance. Had suffered much from head pain, which always began over left eye. Years before the pain had lasted for two or three days, but latterly it usually passed off after a sleep of half an hour. Examination showed R.E.S 20-20; L.E.S. fingers at four feet; slight injection of sclerotic. Cornea rough over outer third and center, reflex abolished as shown by touching with cotton spill, T minus. Cornea looks as though fine sand had been dusted over it. Under strychnia, arsenic and quinine, hot fomentations and boracic acid, for a period of ten weeks, he recovered with perfect sight and only a fine nebulous eschar.

February 15th, 1897, E.F.C., aged 31, electrical engineer in charge of Pennsylvania system, consulted me for the purpose of having a foreign body removed from right eye. He had already visited an experienced ophthalmologist in Pittsburg, who informed him that there was a solution of continuity on the cornea, but no foreign body was present. A drop of cocaine was employed, and patient went about his work of inspecting some mechanical devices in the city. He did not note the irritation again until next morning, when he arrived in Fort Wayne. He then called at my office. Inspection showed no infection at sclerocorneal junction. Very slight photophobia, with pupil contracted, and a roughening of epithelium at inner upper quadrant, T clearly minus one. No sensation over roughened area, and practical abolition of corneal reflex when tested over remaining clear corneal area. With the glasses which he was wearing R.E.S. 20/40; L.E.S. 20/15, and treatment with strychnia hypodermically, faradization and hot compresses, he recovered in twelve or thirteen weeks. His functional examination showed R.E.S. 20/70; with + 4 D 20/30; L.E.S. 20/30; with + 4 D 20/30 hyperphoria 2° which had already been corrected by prisms.

Another case is characteristic of these three and I will omit details. The second case detailed, and the first of tropho-neurotic keratitis series, passed out of my hands, because my acquaintance with the prognosis was not sufficient to establish either a maximum or a minimum time during which treatment should be carried on. The enucleation of the eye by my partner, Dr. T. J. Dills, recalled the history of the case.

These cases present the following features common to all, viz.: loss of sensation in area of corneal involvement; subnormal sensibility, not total loss of sensation, over area of unaffected cornea and abolition of corneal reflex; tension variable, but always minus; contracted pupil; slight pain, if any; slight irritation and then always as though a foreign body were in the eye; little or no circumcorneal injection. The time over which active therapeutic measures should be employed is ten to fourteen weeks. These cases all recovered with good vision and a very slight nebulous eschar.

The name *tropho-neurotic keratitis* is distinctive and I think should be adopted for the class of cases which I have described, because the name is significant of the organs involved and points to the trophic fibers of the Gasserian ganglion as the seat of lesion. The name *neuroparalytic* should be abandoned, except in cases where gross lesion of the brain is present, or the ganglion is involved *en masse*, or when, in the presence of evident involvement of the trophic fibers, there is also a general lesion of the entire ganglion, as shown by loss of sensation throughout the whole distribution of the fifth nerve. Such a case as referred to in the last division I have seen as a result of periostitis of the petrous portion of the temporal bone and due to inherited syphilis. The case in point is that of a little girl, ten years old, in which the trouble was symmetrical, but only the right cornea had undergone central ulceration with perforation. In this case so profound was the anesthesia that a tooth had been extracted without pain, and the incident was referred to as indicating great heroism on the part of the little patient.

Tropho-neurotic keratitis differs in its pathology from *keratitis e lagophthalmo*, in that in the latter condition the lesion of the cornea is the result of exposure from an uncovered cornea, together with general loss of resistance on part of all the tissues. In tropho-neurotic keratitis the lesion is found under the covered cornea. Snellen's theory of exposure and mechanical irritation is not tenable in this class of cases. We must also differentiate from keratitis malacia. We have all seen cases of hemianesthesia of the face in which there has been no desiccation or ulceration of the cornea. I am disposed to think that the sympathetic fibers supplying the Gasserian ganglion play a very important rôle in the nutrition of the cornea. The cases which Noyes refers to as superficial keratitis of malarial origin have all the ear-marks of the cases which I have described, and he, together with all authors including Von Graefe, has failed to distinguish between the gross involvement of the ganglion and the involvement of the trophic fibers alone. Von Graefe described those cases, but fails to recognize the influence of the trophic fibers. de Schweinitz in "Diseases of the Eye," last edition, describes the trophic and neuro-paralytic form, and casually groups them under "neuro-paralytic" disturbances of the cornea. Fuchs in his admirable work refers to the probable trophic origin of certain corneal ulcers. Schmidt-Rimpler in his third German edition of "Ophthalmology and Ophthalmoscopy," translated by Roosa, comes very near the exact truth in his opening sentence on the subject of keratitis neuro-paralytica. He says: "The form of keratitis which develops in paralysis of the trigeminus may correspond entirely to the xerotic form in its appearance and course." Finally, Meisner and Schiff have shown experimentally that the characteristic inflammation known as keratitis tropho-neurotica occurs when the central fibers of the Gasserian ganglion are divided. In cases of paralysis of seventh, where the cornea is not covered or even swept, except by extreme contraction of superior rectus and inferior oblique, we yet have no evidence of desiccation.

THE JAVAL OPHTHALMOMETER—SATTERLEE'S MODEL.

BY RICHARD H. SATTERLEE, M.D.

Consulting Oculist for Buffalo Railway Co., Buffalo, Rochester and Pittsburg Railway, Buffalo and Niagara Falls Railway.

OF BUFFALO, N. Y.

[Illustrated.]

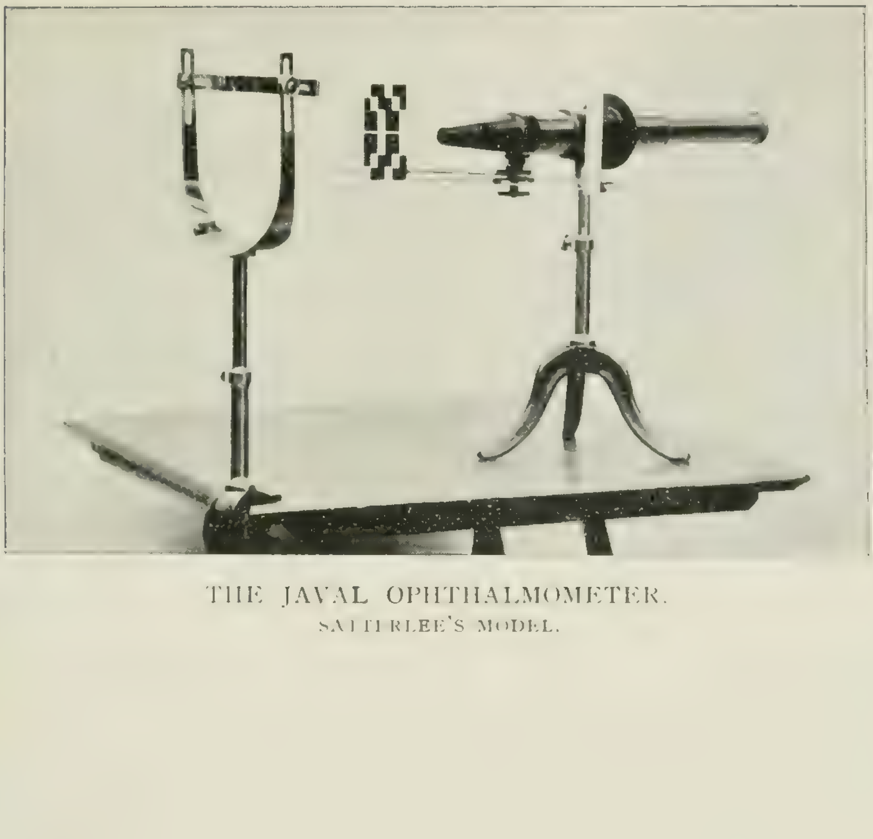
The objection to the Javal-Schiötz ophthalmometer, or its American copy, has been its cost, its size, and weight, and the number of lens surfaces, which latter made very bright illumination of the mires necessary.

What has also tended to discourage the use of the instrument has been the difficulty of finding bi-refringent prisms which were accurately ground and that produced clear images.

The instrument illustrated is made of smaller tubing, the bi-refringent prism of the original Javal being replaced by ordinary prisms, making less illumination of the mires necessary.

As shown, the instrument is used with ordinary daylight. A small disk and two electric lights or Argand gas burners are furnished when it is desirable to use in a dark office. Anyone having occasion to move the Javal, as usually constructed, will appreciate an instrument that can be packed in an ordinary grip.

The instrument is manufactured by the Ogden Ophthalmometer Co., of Buffalo, New York.



THE JAVAL OPHTHALMOMETER.
SATTERLEE'S MODEL.

THE
OPHTHALMIC RECORD.

A MONTHLY REVIEW OF THE PROGRESS OF OPHTHALMOLOGY.

VOLUME VII. CHICAGO, FEBRUARY, 1898. No. 2 NEW SERIES

EDITORIALS.

PILOCARPINE IN CHORIO-RETINITIS AND VITREOUS OPACITIES.

Soon after the introduction of the alkaloid of the *pilocarpus jaborandi* into the general medical armamentarium, the attention of ophthalmologists was directed to its value in ocular therapeutics, quite independently of any local action which it exercised upon the accommodative apparatus or the intraocular tension. Its extraordinary influence as a diaphoretic, as a remedy which facilitated the removal of effusions, and as a medicament which seemed, under certain circumstances, to powerfully stimulate and alter the nutrition of diseased areas, and even of tissues that were not diseased, for example, the hair bulbs, led to its use for the relief of exudative inflammatory affections, especially when located in the uveal tract. Some of the results following the use of this remedy in the treatment of irido-choroiditis with vitreous opacities, equatorial choroiditis with circumscribed choroidal atrophy, diffuse infiltration of the retina and hyalitis, and even the neuro-retinitis of Bright's disease, as recorded by Landesberg in 1881 and von Schroeder in 1883, were strikingly favorable, and as its efficiency became established it was soon recognized as an important remedy in the management of cases of this character.

Although clinical experience has not indicated its utility in the management of keratitis, for example, of the interstitial variety, it has proved its great use in certain types of iritis and irido-cyclitis, as, for example, those recorded by Buller some years ago, its value, in the writer's experience, being particularly great in the iritis and kerato-iritis which sometimes seem to be of gonorrheal origin, and even in those varieties which are probably gouty in nature.

Not only, however, does the remedy seem to be active when it is used in large and diaphoretic doses, but also when employed in more moderate amounts. Thus, in 1892, in the *Archives of Ophthalmology*, Dr. James A. Spaulding contributed an excellent practical paper on idiopathic vitreous hemorrhages, concluding that the most efficient treatment of this affection required the hypodermic use of small doses of pilocarpine, believing, moreover, that it was not necessary to produce visible physiological effects for the remedy to be useful in the eye. Shortly afterwards, in the *Therapeutic Gazette*, the writer described a treatment of vitreous opacities with the fluid extract of jaborandi, and reported a number of cases in which the vitreous had cleared under the influence of the drug when the opacities were hemorrhagic in origin, and also when they had been associated with types of quiet iritis and low-grade choroiditis. None of these cases, of course, were of syphilitic origin.

Recently Dr. Howard F. Hansell (*The Philadelphia Polyclinic*, November 20, 1897,) has published a most suggestive and instructive paper on the use of pilocarpine in non-syphilitic central retino-choroiditis. In one case the vision was raised from $\frac{20}{200}$ to $\frac{20}{20}$? in a month, and in another case from $\frac{20}{50}$ to $\frac{20}{20}$ in one week; in two other cases there was marked visual improvement. Dr. Hansell's description of the action of pilocarpine under these circumstances is so clear that it is quoted in his own words, namely: "The efficiency of pilocarpine is to be attributed to the inordinate activity of the lymph system induced by its presence. By depriving the peripheral vessels of a large portion of their fluid contents those of the internal organs meet the deficiency, thus eliminating morbid products, together with physiologic excretions." An interesting fact in connection with Dr. Hansell's cases is that potassium iodide and mercury had been previously exhibited in large doses without avail.

A word as to the manner of administration. Pilocarpine is to be preferred and the hypodermic method should be adopted. If in rare instances this is not advisable, or is strenuously objected to by the patient, equally good results, although perhaps not so promptly or actively produced, may be secured by enemas of the fluid extract of jaborandi. The hypodermic dose of pilocarpine may vary from a twelfth to a sixth of a grain, under ordinary circumstances, and should be repeated every second, third or fourth day, according to the patient's power of resisting so active a remedy. Now and then, probably owing to idiosyncracy, very disagreeable results follow its use, as no doubt has been the experience of each surgeon who has employed it. Thus, there may be marked nausea, evidences of pulmonary oedema and occasionally serious cardiac depression. It has been the writer's habit to administer about an hour before the injection thirty drops of chlorodyne. The use of this remedy in this manner has been advocated by so high an authority as the professor of therapeutics in the University of Pennsylvania, and will usually prevent the nausea. During the days devoted to the pilocarpine treatment, small doses of tincture of digitalis may with advantage be administered, tending as they do to prevent cardiac depression and to steady the circulation. Occasionally a patient will be found who curiously resists the action of pilocarpine, while in others the remedy, instead of exciting diaphoresis, will exceptionally produce the untoward symptoms already noted. G. E. DE S.

THE STATUS OF OPERATIONS FOR HETEROPHORIA.

The large majority of ophthalmic surgeons have held aloof from the heresy of "graduated" multiple tenotomies, despite the advocacy in the past of such procedures by several distinguished men whose reputation is conceded and whose genius is admired. Time has shown that there was warrant indeed for looking askance at the assertions of the high priests of graduated tenotomies, not only as regards their claims for the cure of functional nervous affections, such as chorea and epilepsy, but concerning the actual mechanical result upon the muscular equilibrium thereby produced. It is doubted by many that it is possible to cause any permanent effect by one or more so-called graduated or incomplete tenotomies. Those that have tried nicking the tendon of the muscle have found that positive results have not been forthcoming. Even after several or many operations upon the same muscle the equilibrium is found to be the same as before, and only a practically complete division of the tendon and its accessory fibers can produce a permanent result.

The question of muscular advancement, or of tenotomy, has not been settled. Advancement, despite its severity, theoretically offers the most permanent results, as it increases the motility of the eye-ball, whereas this is diminished by tenotomy. But advancement of a weak muscle will ofttimes fail as well as tenotomy of a very strong one, for if the extraorbital causes still obtain the result may be only temporary.

Some advocates of operative interference for ocular imbalance in the functional neuroses fail to recognize the fact that heterophoria, or even squint, may be only a symptom, and that but a small proportion of such cases are dependent upon too powerful or too weak muscles, or improper insertion of the tendons. Functional heterophoria is largely a child of deficient innervation and is only to be cured by removal of the cause, which is that of the hysteria, chorea, epilepsy or other existing functional disturbance. Exophoria and deficient convergence is a common symptom of these functional neuroses and is known to be a symptom of fatigue in otherwise normal eyes.

The so-called latent heterophoria, more especially esophoria, the production of which is advocated by a recent author, is readily caused by the constant wearing of prisms; and yet even this manufactured heterophoria should, if we would believe a book by this author, be cured by tenotomy. The wide publicity and peculiar advertising by which his work has been forced upon our attention certainly gives cause for the remark that the book is a dangerous one, especially in the hands of the empiric or inexperienced. The acceptance of the so-called principles therein proclaimed, which were promulgated several years ago, has already produced a pernicious effect.

A large number of ill-considered and damaging operations have been done through following these so-called precepts. The cure of diseases, varying from diabetes to dysentery, and from trachoma to teratoses, by the method of operating upon the ocular muscles, has been proclaimed from the housetops. A number of instances are known to the writer where bungling operations have been done without warrant by these men and, sad to say, by some men whose professional attainments are popularly esteemed good, in which the sclera has been cut through, detachment of the retina and loss of sight or even infective panophthalmitis has been produced, to say nothing of loss of ocular motility or diplopia. The incoördinating ocular muscles in tabes dorsalis, paralyzed muscles and their antagonists, have been interfered with, followed by resultant diplopia and squint, which could not be entirely remedied by secondary operation.

The era of indiscriminate and ill-advised operating has passed for those who have their eyes open, and conservative practitioners hope to soon see the day when this dangerous heresy has been relegated to deserved oblivion.

Any operative interference with the ocular muscle apparatus should only be done after full trial of muscle exercise, correction of refraction, attention to the general health, and apparent cause. But one, or at the most two, operations are allowable upon the same muscle. In many cases prisms relieve the symptoms sufficiently to render operation obnoxious to the patient.

Some good has come out of Egypt; the technique of tenotomy and muscle advancement has been revolutionized. Through the phorometer, the Maddox rod, the tropometer, the revolving prisms and their modifications, we are now able to establish definite data concerning the deviation, excursion and strength of the muscles and to accurately limit the effects of our operative procedures. Through the recognition of the dependence of muscular equilibrium upon proper innervation we exclude many cases of heterophoria, and cure without recourse to weakening the eye further by tenotomy.

The fact that many causes may combine to produce imbalance of the ocular muscles is now being learned, and although we recognize the fact that disturbances of the ocular equilibrium produce symptoms which may show as headache or nervous reflexes far from the eye, we are learning to take a broader view and to search for and attack the primary causes which in many cases are not within the orbit. We should remember the fact that muscle imbalance may be a symptom of nervous derangement, as well as that eye strain may produce reflex nerve disturbances.

H. V. W.

THE INCORRECT USE OF CERTAIN WORDS AND PHRASES.

Some time ago a contributor to the columns of a journal devoted to general medicine contended that the use of *cycloplegia* and *mydriasis* as synonymous terms and of *mydriatic* and *cycloplegic* as interchangeable adjectives and adjective-nouns is one of the commonest errors one meets with in medical literature. There seems to be reason for repeating this statement and to point out once more (see *Journal A. M. A.* Mar. 9, 1895) that a mydriatic may be, but is not necessarily, a cycloplegic, even though a cycloplegic is usually a mydriatic. A giant is always a man, but men are not necessarily giants. The electric current and a quarter-grain solution of cocain are, under certain conditions, mydriatics, but neither of them is a cycloplegic. If one wishes to refer specifically to the dilatation of the pupil the ancient term *mydriasis* should be employed, reserving the modern word, cycloplegia, (from *κυκλος*, a circle, *i. e.*, the ciliary ring, and *πληγη*, a stroke) for indicating a paralysis of the ciliary muscle.

The following sentence will serve to indicate these differences of application; "if one desires to measure the total ametropia it is usually necessary to employ a *cycloplegic* (not mydriatic), but for an examination of the fundus a mydriatic will suffice."

The following sentences contain examples of the improper use of certain words that occur occasionally in our medical journals. The objectionable words are italicized: (*a*). On the next day we *operated* the child. (*b*). Care should be taken not to *operate* the cataract too soon. (*c*). If the *operated* eye remains quiet it is better to interfere early. (*d*). These symptoms may be due to a swollen *turbinate.* (*e*). The *iritic* reflexes were found to be normal. (*f*). It is often difficult to *refract* such a patient. (*g*). In cases where the *refracted* eye is shown to be emmetropic (*h*) the *refractor* places a convex lens before his own eye.

(*a*), (*b*), (*c*). In Vicente Salva's Spanish-Spanish-Latin dictionary, the nearest approach to a Latin equivalent of the Spanish word *operar*, *to operate upon*, is given as *operationem chirurgicam peragere.* The English language has in this particular followed the Latin construction more closely than the so-called Latin languages themselves. There is no single transitive verb (derived from *opus*) in either tongue that conveys the idea of the performance of a surgical operation. If there be such it will be found in the works of modern writers of Latin who, under German, French, Italian, or Spanish influence, have coined a corrupted derivative (*operare*) from the deponent verb *operari*, which has quite a different significance from *operar*, *opérer*, *operare* (Italian) and *opereiren*, which are, in a perfectly legitimate sense, transitive. It is probable that the above mentioned and objectionable use of the English verb may be traced to the same source. This probability will be brought out by the following short sentences and phrases taken at random from foreign publications: *Ich habe das operirte Auge sehr oft untersucht. Einen Blinden, die Augen, den Staar u. s. w. operieren. Ce chirurgien est habile, il opère parfaitment bien; il a opéré dans la jaurnee deux hommes qui avait la pierre. Il primo a operare con successo l'estirpazione della laringe fu un italiano.* So that while the continental surgeon we are best acquainted with usually *operates* his patients or their organs, *we* must continue to operate *on* or *upon* them.

(*d*). This word is never used as a noun, although there is abundant authority for the employment of *turbinal*—meaning a turbinated bone. For example, in Huxley's "Anatomy of the Vertebrates" occurs the following: "Forming the floor of the front part of the nasal chamber on each side is a large concavo-convex bone . . . which is commonly termed a *turbinal* . . . does not truly correspond with the *turbinals* of the higher vertebrata." This pretty well disposes of the argument (in favor of "turbinate") that we have no single word in English to designate a turbinated bone.

(*e*). A moment's consideration of the fact that the adjective *iritic*, like *neuritic* and *pleuritic*, has to do with the inflammation of the part designated by the first portion of the word, should be sufficient to prevent the mistake of using it to refer to the part itself. On the other hand, this improper use of *iritic* is not uncommon; I have lately seen it so employed in one of our most widely known medical journals. Legitimate adjectives (derived from *iris*, gen: *iridis*) are numerous enough; there is good authority for *iridal*, *irian*, and *iridian*, not to mention the frequent and proper use of the noun *iris*, as an adjective.

(*f*), (*g*), (*h*). It is not uncommon to witness the incorrect employment of these words, even by those who make some pretensions to scientific accuracy. If we think of their etymology (or consult any dictionary) it will not be difficult to show the inaccuracy of connecting the idea of personality with any of them. One may properly *measure* or *determine* the refraction of a patient's eye,—but ought not to say: "I advise you to refract Mr. Jones," or "You had better refract both his eyes," which would be tantamount to condemning Mr. Jones or his eyes to be broken up or bent back (*re* and *frangere*). In the same way the noun, *refractor*, has been incorrectly given a new meaning—that of a person who determines the refraction of the ocular media, *vulgo*, a man who fits glasses. One meaning of *refractor* is that of a telescope, and the idea is of something that refracts, or turns from their course, light or sound waves.

Although it is undoubtedly true that we cannot with propriety speak of *refractor*, *refract*, and *refraction* apart from a *thing*, yet it cannot be denied that the phrases, "to measure Mr. Jones's refraction," and "to determine the refractive condition of Mr. Jones's eyes," are entirely too clumsy and eat up too much time. Already, in England especially, the shorter expression, "to measure Mr. Jones" (for glasses) is in vogue. In practice this would be less objectionable (to Mr. Jones himself and others) than "to refract Mr. Jones," who might be hard to bend or break.

There is a demand, but less urgent, for some term that will designate the person doing the refraction work above referred to, but that "refractor"—"refractionist" is, possibly, better—meets this philological want is at least doubtful. C. A. W.

REPORTS OF SOCIETIES.

SECTION ON OPHTHALMOLOGY.

COLLEGE OF PHYSICIANS, OF PHILADELPHIA.

Meeting of the Ophthalmic Section of the College of Physicians, December 21, 1897, the chairman, Dr. Wm. F. Norris, in the chair.

Dr. S. D. Risley presented a case of *Cyst of the Orbit, with an Unusual Place of Exit.* The patient is a female child one year old, who has an elastic, almond-shaped tumor on the left side of the face near the nose. It is slightly bluish, not larger, under ordinary conditions, than the kernel of the almond, but when the child cries, or if the head is held downward, the size and nevus-like discoloration are greatly increased. Dr. Freeman examined the nasal passages, and reported that he could discover no nasal conditions to account for its presence. There is no trouble with the lachrymal sac or duct, although its proximity to these structures at once suggests a possible affection of the tear sac. Gentle pressure entirely empties the tumor, which immediately refills when the pressure is removed. When firm pressure is made with the finger on the inner end of the inferior orbital ridge, it is not possible to empty the tumor. When the child is lying on its back asleep, emptying the sac by pressure causes an unmistakable bulging forward of the closed upper eyelid and a disappearance of the palpebral fold. At times there seems to be also a very slight movement forward of the eyeball. The parents first noticed the bluish tumor when the child was but five months of age, and think that it has slowly increased in size. Its nature is problematic. It seems likely that it is a dermoid orbital cyst presenting itself forward over the lower bony rim of the orbit instead of below the superior orbital rim, as is usual. In all respects, except the point of exit, which is certainly very unusual, it presents the same features as the case shown at the last meeting by the president of the Section.

Dr. G. C. Harlan showed a woman, fifty-four years old, with *Exophthalmos, Due to Disease of the Maxillary Antrum.* She had first noticed, in October, the protrusion of the ball and occasional diplopia. When she came to the Pennsylvania Hospital on November 16th, there was decided exophthalmos and up and outward deviation of the eye, which could be partially reduced under pressure. Nothing abnormal could be felt in the orbit by exploration with the finger. There was a diffused swelling of the cheek and temple, but little or no tenderness. The fundus was normal, excepting a moderate congestion of the retinal veins. The left side of the nose had been obstructed for a year, and was found to be filled with growths which were removed with difficulty on account of free hemorrhage. Those first removed resembled ordinary polypi, and were pronounced to be adenoma-myxomatous in character, since no trace of malignant infiltration was evident. The deeper portions were undoubtedly sarcomatous.

The exophthalmos had decidedly increased during the past month, the lids were edematous, the anterior wall of the antrum was bulging and tender to the touch, and the lateral wall, felt through the mouth, was extended. A small, firm growth had appeared in the orbit just external to the lachrymal groove. There was little doubt that the case was one of sarcoma of the antrum, extending into the orbit.

Dr. Harlan also presented two cases of *Traumatism of the Orbit.* One patient had received a severe blow with a monkey-wrench over the malar bone. He was stunned, and remained unconscious for half an hour. He had nasal hemorrhage, conjunctival and palpebral ecchymosis, exophthalmos, diplopia, extensive swelling of the lids, and emphysema. After subsidence of the swelling it was found that the levator and superior rectus were paralyzed. Fracture by contrecoup of the roof and inner wall of the orbit was diagnosed.

In the case of the other patient a violent blow on the superciliary region was followed by orbital cellulitis, with exophthalmos and abscess. Three incisions were required during the treatment. There is now enophthalmos and paresis of the levator and superior rectus—the result of atrophy and cicatricial contraction of orbital tissue.

Dr. Harlan had at the same time under treatment a man who had been kicked in the region of the glabella. He had enormous emphysema extending as far back as the posterior edge of the parietal bone, probably the result of fracture of the lachrymal duct. He was quite well in a few days.

Dr. William Zentmayer exhibited a *Case of Probable Remnants of the Sheath of the Hyaloid Artery*, showing a pyriform, white, connective-tissue mass springing from the porus opticus and extending forward, upward, and toward the mascular region in front of the retina. It is about

1½ disk diameters in length and about ¾ in width. Projecting from the lower part of the anterior surface there is a conical mass of similar appearance. Two streamers come forward into the vitreous, one toward the posterior pole of the lens, the other toward the temporal side. The level of the fundus is 1.5 D, and that of the growth 4 D.

Discussion.—In answer to an inquiry of Dr. Shaffner, Dr. Zentmayer replied that no opacity of the posterior pole of the lens is present.

Dr. Randall was uncertain that the diagnosis made by Dr. Zentmayer is correct, since in many cases that have fallen under his observation, remnants of the artery have always extended toward the nasal and not toward the temporal side. They are frequently uncomplicated by opacity of the capsule or lens, even if branching upon the posterior pole.

Dr. B. A. Randall reported a *Case of Transient Opacities of the Lens after Traumatism*, and spoke of the importance of noting the frequency and limitations of such changes. A small boy, struck on the left eye by a stone, presented an hour or two after the injury an abraded cornea, blood-stained aqueous, and anterior polar opacity of the subluxated lens. As the media cleared no fundus lesions came to sight; but circles of minute vacuoles around the anterior pole of the lens seemed certainly within the capsule, although resembling the remains of an annular synechia, while many vague shoots of opacity were seen in the periphery of the median layers. The unfavorable prognosis was most agreeably falsified, and all opacities gradually faded and had completely disappeared, with restoration of good vision, two weeks after the injury.

Discussion.—Dr. Frank Perkins had observed, in a case of traumatism inducing a small retinal detachment, hyalitis and opacities of the posterior lens capsule, that after twelve months the capsular opacities had disappeared and the vitreous had become clear.

Dr. Randall also reported a *Case of a Secondary Center of Distinct Vision* in an eye that had squinted. A woman of 54 who had convergent strabismus after whooping-cough at three years of age, had double-squint operation when 31 years old, followed by decided divergence. Habitually the left eye diverges about 20° in distant vision as measured on the perimeter, yet vision is partly binocular and any diplopia is homonymous. With her H.As. corrected, vision is almost perfect in each eye, and full $\frac{6}{5}$ with both, although the left has to come in 20° when the eye is covered. At near work with presbyopic correction there is binocular vision, with no divergence, but some 8° of insufficiency, partial correction of which, by decentering her glasses, is relieving her asthenopic symptoms.

Discussion.—Dr. Harlan referred to a case in which he had extracted a cataractous lens from an eye with long standing convergent strabismus. When the bandage was removed the patient recognized her daughter, who stood directly in front of her, but saw her in the extreme outer periphery of the visual field. This false projection lasted only a few days.

Dr. Edward Jackson read a paper on *Removal of the Clear Lens for High Myopia*, and presented a young man upon both of whose eyes he had operated. The lens had been first needled and later extracted. In the first eye the needle was free, the changes in the lens rapid, and the reaction severe, resulting in vitreous opacity, which required three months to clear up. In the other eye but a small opening was made in the capsule, and the lens substance was removed before the reaction became severe, and good vision was obtained as soon as the pupil cleared. The vision with the correcting lenses, before removal of the crystalline, was $\frac{5}{30}$ and $\frac{5}{25}$; after removal it was $\frac{5}{9}$ in each eye, with weak compound convex lenses.

The operation undoubtedly has a real field of usefulness. Those who had written upon it have, so far, failed to demonstrate scientifically the amount of myopia to be corrected by removal of the crystalline. Assuming that its refractive power was constant, when the effect of its removal was measured at the cornea instead of at the position of the lens, it would make an essential difference whether that effect was to be compensated by a convex lens, or whether it was measured by a concave lens.

To solve problems of this sort a *dioptric eye* was suggested, in which the refraction of the eye was conceived to occur at two infinitely thin lenses, one situated at the apex of the cornea having a focal distance of 31 mm. (a refractive power of 32.26 D.), the other 6 mm. behind the cornea (having a refractive power of 20 D.). These acting together would focus parallel rays 16⅔ mm. behind the second lens, or 22⅔ mm. behind the cornea, corresponding to a refraction of 44.12 D. With such an eye the removal of the crystalline lens, supposing the eye to be previously emmetropic, would cause hyperopia of 11.86 D., measured at the cornea, which would be corrected by a 10.5 D. convex lens placed in the ordinary position for a correcting lens.

On the other hand, if the retina were situated just 31 mm. behind the cornea, where it would receive rays perfectly focused by the action of the cornea alone, it would have, before removal of the crystalline, a myopia of 14.30 D., as measured at the cornea, which would require for its correction a concave 17 or 18 D. lens placed in the ordinary position. This amount of axial myopia, then, is what we may expect to correct by removal of the crystalline lens. If the myopia were due to excessive curvature of the cornea or crystalline, the amount corrected would be different.

The enlargement of the retinal images secured by removal of the crystalline as compared with the retinal images obtained by correcting-lens placed at the anterior focus of the eye amounts to over 50 per cent. Such an enlargement of the retinal images and the avoidance of strong glasses are the chief benefits to be obtained by removal of the clear crystalline-lens.

In planning the operation for removal of the crystalline, the existing corneal astigmatism should be taken into account, and the incision so placed as to correct it, or utilize it to partly correct the astigmatism produced by the operation.

Discussion.—Dr. H. F. Hansell spoke of the great practical value of Dr. Jackson's paper, and exhibited, in illustration, a patient who had been operated on, in one eye, some years ago in Russia. As a means of checking the growth of the myopia and the fundus changes, and of reducing the myopia to a very small amount, the operation had been entirely successful. But in this case an inoperable degree of M. on the other eye, correctable by a concave sphero-cylinder and preservation of accommodation, prohibited binocular simultaneous fixation. Should, however, the M. increase or detachment of the retina occur in the unoperated eye, the benefits of the operation would be promptly appreciated, but removal of the lens in one eye only is of very little immediate advantage, provided M. and disease have not rendered the second eye unfit for use.

Dr. Shaffner mentioned as difficulties to be encountered in the removal of the lens, the sticky, soft lens matter that must be extracted from the anterior chamber, the repeated operations often necessary, with their attendant dangers to the safety of the eye, and the loss of accommodation. The only case he had ever seen bitterly regretted having submitted to the operation.

Dr. Jackson said that if the myopia was so high that correcting-glasses could not be worn, the power of accommodation was of no practical value. If correcting-lenses could be worn with comfort, of course the power of accommodation was of great value. The loss of accommodation, therefore, need not weigh against removal of the crystalline in the only cases requiring it, namely, those which could not wear correcting-lenses. In the case shown by Dr. Hansell the difference in refraction between the two eyes precluded their satisfactory working together; and the patient was clearly better off for having the power of accommodation in one of them, since he could wear a correcting-lens and make this power useful. He had recently seen a case with 20 D. of myopia, who got some benefit from correcting-lenses, but found them so annoying that he often laid them aside. In this case 15 D. of the myopia was due to excessive curvature of the cornea, and working the case out with the aid of the dioptric eye, it was clear that less benefit was to be expected from removal of the crystalline than if the myopia were axial.

Howard F. Hansell,
Clerk of Section.

CHICAGO OPHTHALMOLOGICAL AND OTOLOGICAL SOCIETY.

A regular meeting was held January 11th, 1898, Dr. Montgomery in the chair.

Dr. Casey A. Wood reported a case of *Primary Sarcoma of the Lid*, in a baby 7 months old, in whom a slight elevation on right upper lid was first noticed when child was 6 weeks old. When first seen by Dr. Wood there was present an irregular oval, apparently movable body of rather firm consistence, and of the size of a white bean situated on the right upper lid occupying the junction of the middle and inner third of the lid. In appearance it was not unlike the ordinary chalazion. The dermal vessels were slightly more numerous and larger than those of the opposite side. The vascular supply is decidedly greater than in the ordinary non-suppurating chalazion. The tumor was removed completely from the conjunctival surface. Dr. W. A. Evans, of Columbus Medical Laboratory, examined the growth and reported as follows: "The tumor appeared to be encapsulated. Microscope showed it to be composed of round and spindle cells—more of former—with considerable intercellular substance. Some pre-existing fibrous tissue, an artery with unusually thick walls. The growth is a sarcoma."

This paper will appear in full in the March number of the Ophthalmic Record.

Discussion.—Dr. C. P. Pinckard asked Dr. Wood how he happened to think of sarcoma. He did not see anything in the description of the case that would contraindicate a diagnosis of chalazion.

Dr. Wood said in answer to Dr. Pinckard, that perhaps he did not lay sufficient stress on the fact of the markedly increased vascular supply of the tumor both on the skin aspect as well as on the conjunctival surface. The vessels, not only upon the tumor itself, but at its borders, were very much larger and more numerous than they are in non-inflamed chalazion.

Dr. Frank Allport showed a case with *Incipient Choroidal Leucosarcoma.*

The patient, a woman, twenty-eight years of age, has a vision of $\frac{20}{20}$ in each eye, and compound hypermetropic astigmatism of medium degree. She has headaches and other asthenopic symptoms.

Two years ago she became broken down nervously, a tendency which has never disappeared. On the right side, an exophthalmic goitre is present, accompanied with enlarged thyroid gland, irregular pulse, occasional profuse sweating, and nervous murmur in the neck. Right fundus is normal except enlarged and tortuous veins.

Incidentally, in the course of the examination, a small roundish grayish-white elevation or tumor was discovered just to the macular side of the disc, which it apparently joins. The tumor is about half the size of the nerve head and looks like a mass of clouds bursting forth from the fundus. The elevation measures about three-quarters of a dioptre, but if the eye is moved to one side or the other the observer may easily see it in raised profile. A retinal vessel courses over its surface, showing it to be under the retina, and some pigment on its surface would seem to indicate it to have originated in the choroid. Forming a semicircle around it may be seen many pigmented choroidal splashes. She has slight ptosis of this eye.

Dr. Allport suspected this elevation to be a leucosarcoma of the choroid, but time must verify this conjecture. If it is, it is a most interesting case, as ophthalmic literature records but few instances of *observed* incipient choroidal leucosarcoma.

Her peripheral field for white is perfect. I did not test for scotoma, on account of the weariness of the patient, and have not seen her since.*

Dr. Henry Gradle reported a case of *Tarsitis*,[1] a full report of which will appear in the March number of the OPHTHALMIC RECORD.

Discussion.—Dr. H. M. Starkey had referred this case to Dr. Gradle's clinic; and from the history he thought the case was probably specific in origin. The mixed treatment was given in moderately full doses without result.

Dr. Wood asked Dr. Gradle whether there was a history of acute articular rheumatism in the case.

Dr. Gradle said, not to his knowledge.

Dr. Charles M. Robertson, of Davenport, Iowa, reported a case of

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*Since this report Dr. Allport has examined the patient's field and found a small scotoma, especially for red and green in the neighborhood of the physiological blind spot.

Glio-Sarcoma of Optic Nerve with specimen, in a healthy boy, 10 years of age, who had for the past two years exhibited exophthalmus of the right eye, gradually increasing until the eye so protruded that the lids scarcely covered the equator of the globe. The case was presented to him for opinion, and its immediate removal was advised. The resistance behind was so great that it was certain there was some sort of solid tumor behind the globe. The motion of the globe was *nil*, as was the visual power. There was some lymphatic engorgement (sub-maxillary), but otherwise no abnormal signs or symptoms. The specimen, showed the eye and tumor as taken away. At the posterior end of the globe the optic nerve was cut off just behind the entrance to the eye, showing a comparatively healthy appearance. The tumor lay immediately behind the eyeball, being a true optic nerve growth. It was encapsulated in front, but attached behind, to the periosteum just external to the edge of the optic foramen. After loosening the tissues around, the tumor was pulled forward, so that excision was made behind the tumor. The growth upon examination proved to be a glio-sarcoma. It was removed in August, 1896. The boy is wearing an artificial eye, and so far there have been no signs of recurrence.

TRANSLATION.

THE NATURE OF GLAUCOMA. EXPLANATION OF THE CURATIVE EFFECT OF IRIDECTOMY. By Dr. Ch. Abadie, Paris. (Translated from the November number of the *Ophthalmologische Klinik*, by Dr. Dunbar Roy, Atlanta, Ga.)

The cases of acute and subacute Glaucoma, with their transitory symptoms (cloudy vision, colored rings around the lights), are to be explained neither by a persistent change in the region of the sclero-corneal junction nor by the decrease of the angle between the iris and cornea, nor by structural changes in the spaces of Fontana. Persistent changes must represent functional disturbances which are persistent and not transitory in their character.

The nervous system certainly is obliged to be interested in such transitory disturbances as disappear without leaving even a trace behind them. Indeed, the opinion of a nervous origin of glaucoma has already been expressed, and in fact, up to the present, the fifth pair of cranial nerves has been described as playing the chief rôle. On account of new discoveries as to the anatomy and physiology of the nervous system, the trigeminus may have to lose some of the functions as not belonging to it. It is simply a nerve of sensation whose sole and only function is to carry the peripheral impressions to its center. It is centripetal and not centrifugal. As has generally been held up to the present the trophic influence, which this nerve was thought to exercise upon the nutrition of the eye, must be attributed to a branch of the sympathetic which accompanies it and which forms a part of the ciliary nerves.

Should one repeat the classic experiment of Majendie and Snellen, namely, the section of the trigeminus within the cranial cavity, in order to produce disturbances of nutrition in the cornea, then these disturbances will not occur or will be limited in their effect, if one at the same time should cut through the cervical sympathetic on the same side. Through the labors of M. Spallitta (*1.*) these facts have been clearly set forth. Similar results can be accomplished by surgeons, since the removal of the Gasserian ganglion is almost never complicated with an involvement of the eye. (*2.*)

The branch of the sympathetic which runs along with the body of the trigeminus in the cranial cavity in order to reach the path of the ciliary nerves to the eye, must certainly play the most important rôle in these nutritive disturbances of the eye.

After the presentation of these facts we will now show that in glaucoma everything gives the appearance as if sometimes a transitory, sometimes a persistent excitation of the vaso-dilator nerve fibres of the blood vessels in the eye had taken place (representing the acute and chronic forms). This, just as I hope to show, is the true origin of the disease. All other symptoms and diseased appearances arise from this. The increased intra-ocular pressure results from the increased blood pressure in the vessels, and perhaps also from the augmented secretion of the intra-ocular fluids which is the result of this last condition. François Franck made the important observation that the vaso-dilators of the eye had the same origin in the spinal cord and ran in the same passage as the nerves which produce a dilatation of the pupil. On this account, it is indeed scarcely remarkable if the pupil in glaucoma is constantly dilated. Excitation of the dilator nerves of the pupil takes place at the same time as that of the vaso-dilator of the blood vessels of the eye. But the most positive proof that glaucoma is really due to the dilatation of the blood vessels of the eye is found in the action of mydriatics and myotics. With the help of these substances we can suddenly produce glaucomatous symptoms, or cause them to disappear. But these remedies only produce a dilatation, or the reverse—a contraction of the vessels of the eye, just as they influence the size of the pupil. Atropine always aggravates the glaucomatous symptoms, if it does not directly cause them. Atropine has, therefore, an indubitable vaso-dilator action. Eserin, on the other hand, always lessens the intensity of the glaucomatous symptoms; it acts, therefore, especially by producing a constriction of the vessels. By means of the use of these two remedies glaucoma may either be produced or made to disappear. Therefore, we are in a position to prove by experiment the real nature of the disease and are even able to demonstrate it.

An iridectomy is more certain in its result in cases of acute glaucoma—subacute glaucoma—and, especially in those cases where the functional disturbances are intermittent. How can we explain the beneficial results of this operation? Our views upon this subject are as follows: Under normal circumstances, the excitor nerves, which regulate the opposite conditions of dilatation and constriction of the blood vessels, run through the nerve plexus situated in the middle part of the iris. In the cells of the iris there also terminates a certain number of ciliary nerve-fibers. If the vaso-dilator nerve excitation preponderates, then this impulse passes without interruption to the above-mentioned nerve plexus, in which the nerve force probably stores itself up; the dilatation of the blood vessels of the eyes is, therefore, the result. Should we, however, cut through this circular net of nerves, then this excessive irritation of the vaso-dilator nerves of excitation will cease, and everywhere there will appear the former equilibrium. At this time the blood vessels are as yet only dilated to a moderate degree. By means of an iridectomy the excision of the iris itself is followed by results not near so beneficial as the removal of a portion of the nerve net, which is situated in the middle portion of the iris tissue.

That this theoretical explanation is well grounded can easily be proven. If you remove, in acute glaucoma, only the sphincter of the pupil, as it many times happens, or only the ciliary periphery of the iris without touching the middle portion, which contains the ciliary plexus, then the result of the operation is nearly always partial. On the other hand, let us be content to remove that portion of the iris in which is found the nerve elements, and let us leave the sphincter and the ciliary portion untouched, then the eye will heal just as favorably as when a complete iridectomy has been performed. For this reason it is unimportant whether the iridectomy be broad or small, provided only that the whole breadth of the iris be removed. I go even further, and say that a simple slit in the iris, without excision, would even be sufficient. That the incising of the sclera and cornea, a sclerotomy, in spite of the opinion of several authors, exercises no healing influence upon the eye, demonstrates the fact, moreover, that in this operation without iridectomy, only a transitory improvement is established, and that the glaucoma always returns again. Moreover, should a typical iridectomy be made, even if only the cornea is incised, then the result is just as satisfactory as when the incision has been made in the sclerotic. [A fact noticed by the translator.]

All this, as I believe, satisfactorily and convincingly proves that the glaucomatous symptoms will be lessened only by the excising a part of the ring plexus of nerves which is situated in the iris tissue. Chronic glaucoma presents a somewhat different picture; here the glaucomatous symptoms are not intermittent. The intra-ocular pressure increases slowly, but progressively, and produces, while it continues, a glaucomatous atrophy of the optic papilla without showing the slightest reaction. In this form of glaucoma, usually neither the iridectomy nor the sclerotomy give permanent results. Shall we, for this reason, conclude that the nature of this disease is different from the other? On the contrary, by no means. Even in this form atropine and eserin act in the same manner as in the acute forms, or in such as are intermittent in character. Here, also, the dilatation of the blood vessels play an important rôle, for the instillation of atropine always increases the severity of the symptoms. Eserin and pilocarpine, however, with their like action upon the blood vessels, always produce a decided improvement in the symptoms. We can even justly call it the one healing remedy for simple chronic glaucoma. But these myotics exercise a healing influence only on the condition that they be instilled regularly and systematically every day. Just as soon as we cease their use the intra-ocular pressure rises anew, and the disease takes its usual course. Why does this happen? For the reason that after twenty-four hours the vessel-constricting power of the eserin and pilocarpine is exhausted, and new instillations are necessary in order to keep up the constricted calibre of the vessels. We can, indeed, offer no more convincing proof than this.

In simple chronic glaucoma the dilatation of the blood vessels of the eye is continuous. If it, as it might be, according to some authors, were a question of giving away of the tunics of the eyeball, or even of the optic nerve, would the action then of the atropine and the eserin be explicable, with whose help, so to speak, we can at pleasure modify the disease? Yet another question: Why is the iridectomy by this form not near so beneficial as it is in the acute and intermittent? An explanation is, indeed, not easily found; however, I may be permitted to express my views upon this subject: In the acute and intermittent forms the vessels in the anterior portion of the bulb are especially concerned. The dilatation of the vessels will be noticed then in the ciliary region and the iris; the nerve branches, which regulate the vaso-dilatation and the vaso-constriction of this region blood vessels, are exactly those which run into the nerve plexus of the iris.

Should we cut through this plexus then the dilatation of the vessels would have to cease. This hypothesis is just as plausible as that for the vaso-dilator nerves already mentioned above, having as they do the same origin and running in the same course as those nerves which produce a dilatation of the pupil. In simple chronic glaucoma, was there then no more filling of the blood vessels in that portion of the eye, these changes would be noticed. Only in the choroid would dilatation of the vessels appear; therefore, the appearances then of hypersecretion which accompany every dilatation of the vessels might be far less pronounced, and the tension would likewise increase much more slowly. On the other hand now, the vaso-dilator nerve fibres of that region are not the same as those for the vessels of the iris, nor do they terminate also in the nerve plexus of the iris; nor is any incision through this plexus able to produce any further curative effect. With the iridectomy we are, indeed, fortified to be able to combat all forms of the acute, subacute and suddenly-appearing forms of glaucoma. Against the simple chronic glaucoma, however, we possess measures of far less beneficial value. In many cases neither the iridectomy nor the sclerotomy give satisfactory results, while even myotics, although employed regularly and systematically, do not produce a healing of the pathological condition, and in time the eye remains just where it was before. We are even obliged to acknowledge that there are certain forms of simple chronic glaucoma which, in spite of an iridectomy, sclerotomy, and the continued use of myotics, take on an extremely protracted although progressive course, which finally leads to blindness. In such cases as defy all our present therapeutical remedies the healing must be sought from other measures.

According to our meaning we could limit the influence of the vaso-dilator nerves of the eye by cutting through the body of the cervical sympathetic in which the vaso-dilator nerves run just as has been done before in Basedows' disease and with marked result. Even now, I believe I am able to predict that section of the cervical sympathetic is destined to play an important rôle in ophthalmology. The extirpation of the ophthalmic ganglion would probably give good results, but on account of the smallness of this ganglion, situated deep in the fatty meshes of the orbital cavity, and the great difficulty of avoiding section of the ciliary nerves and the central artery of the retina, this operation can scarcely be considered as practicable. However, in cases of painful glaucoma, with loss of visual power, one might choose it in place of enucleation. It would certainly be permissable to find yet another method which would overcome the difficulty in the treatment of simple chronic glaucoma. We might try, for instance, to make a scar, which at the same time would act as a filter. In this case we would indeed be contending not against the origin of the disease itself, but against its resulting conditions; hence, we would not be retarding the too copious secretion of the intra-ocular fluids. By regulating, however, the outflow of fluid, we generally restore the pressure to a normal equilibrium.

Unfortunately the simple sclerotomy has not given the anticipated results in accomplishing the above. Usually the edges of the wound unite themselves throughout without the formation of a cystoid scar, and the fluid which is secreted in excess does not percolate itself through the wound much better than before. In order to produce a degeneration and permeability of the scar, after making a sclerotomy, we could allow a piece of cat-gut, or a flap of conjunctiva to remain for some time between the edges of the wound—a method which has already been proposed.

There now remains a problem for surgeons to solve, and that is a method of simple sclerotomy by which there will be produced a permanent cystoid degeneration at the seat of the wound. This scar would then play the rôle of a safety valve, and in this way hinder the intra-ocular pressure from rising above a certain degree.

(1) *Annales d'Oculistique*, 1896.

(2) *Krause.* The neurology of the trigeminus, in reference to the anatomy and physiology of the nerve.

NEWS ITEMS.

Personals and items of interest should be sent to
Dr. Frank Allport, 92 State St., Chicago.

FOR SALE OR EXCHANGE.—Knapp's Archives of Otology, volumes eight to twenty-four, inclusive.

CASSIUS D. WESCOTT,
31 Washington St., Chicago.

A SUIT to recover $40,000 damages for alleged libel, brought by Joseph A. MacKeown, an optician, of 24 East Forty-second street, New York, against Dr. Frank Van Fleet, who, in an address before the Medical Society of the County of New York had spoken of him by implication as a quack, was tried recently in the United States Circuit Court before Judge Wallace and a jury, A verdict was rendered for the defendant.—*Medical Review of Reviews.*

Die Ophthalmologische Klinic, a German edition of the *Clinique Ophtalmologique*, will be published under the editorship of Drs. Konigshofer and Zimmermann, of Stuttgart. It will be an international bi-monthly review of pathology and therapy of eye diseases, and will contain several original articles of clinical interest in each number. The first number was issued November 1, 1897, published by the editors from Stuttgart; price in Germany and Austria, 8 marks (about $2.00), and to foreign countries, 10 marks (about $2.50) a year.

PRIVATDOCENT Dr. Richard Greeff has been appointed Director of the Eye Department of the Charité in Berlin, succeeding Prof. Dr. Burchardt, recently deceased.

FRITHJOF HOLMGREN, professor of physiology in the Upsala University, etc., so well known to the world on account of his theory of color perception and other writings, died August 14, 1897, at the age of 66, in Upsala, of heart failure.

Dr. Theodor Axenfeld, Privatdocent to the Breslau University, and first assistant to the Eye Clinic, has accepted the position of professor of ophthalmology to Rostock. He is known largely on account of his bacteriologic work with Prof. Dr. Uhthoff.

The Western Ophthalmological, Otological, Laryngological and Rhinological Association will meet, as heretofore noticed by The Ophthalmic Record, in Chicago, April, 1898.

It is intended to make the meeting in Chicago an interesting one. The general scheme will be to have a joint morning session the first day, when the necessary addresses and responses will be followed by papers by Drs. H. Knapp, of New York City; J. O. Roe, of Rochester, and G. Sterling Ryerson, of Toronto. In the afternoon separate sessions will be held, one for the eye, and one for the nose, throat and ear. In the evening there will be separate sessions also. On the second day there will be separate morning sessions, with a joint afternoon session, then adjourning so as to leave the evening free for such entertainments as may be arranged by the local Chicago committee. On the afternoon of the second day there will be a time set aside for the presentation of cases, pathological specimens or new instruments. Everything points to a large and enthusiastic meeting.

At the annual meeting of the Chicago Ophthalmological and Otological Society, held January 11, 1898, the following officers were elected: President, Dr. W. Franklin Coleman; Vice-President, Dr. Horace M. Starkey; Secretary, Dr. C. P. Pinckard; Committee on Membership, Drs. F. C. Hotz, W. T. Montgomery, and Wm. H. Wilder.

The American Homœopathic Ophthalmological, Otological and Laryngological Society will hold the next annual meeting in Chicago in June. The officers are: Wm. R. King, M. D., President; Charles H. Helfrich, M. D., Secretary and Treasurer.

For Sale.—De Zeng refractometer 1898 pattern. For information, apply to Dr. B. M. Hanna, 812, Penn Ave., Pittsburg, Pa.

A banquet will be given Tuesday evening, February 8th, by the members of the Chicago Ophthalmological and Otological Society, to Dr. E. L. Holmes, to commemorate his long and valuable services to ophthalmology and to felicitate him on his seventieth birthday.

The following advertisement, taken from a dental journal, is that of an optical college situated in a prominent Eastern city.

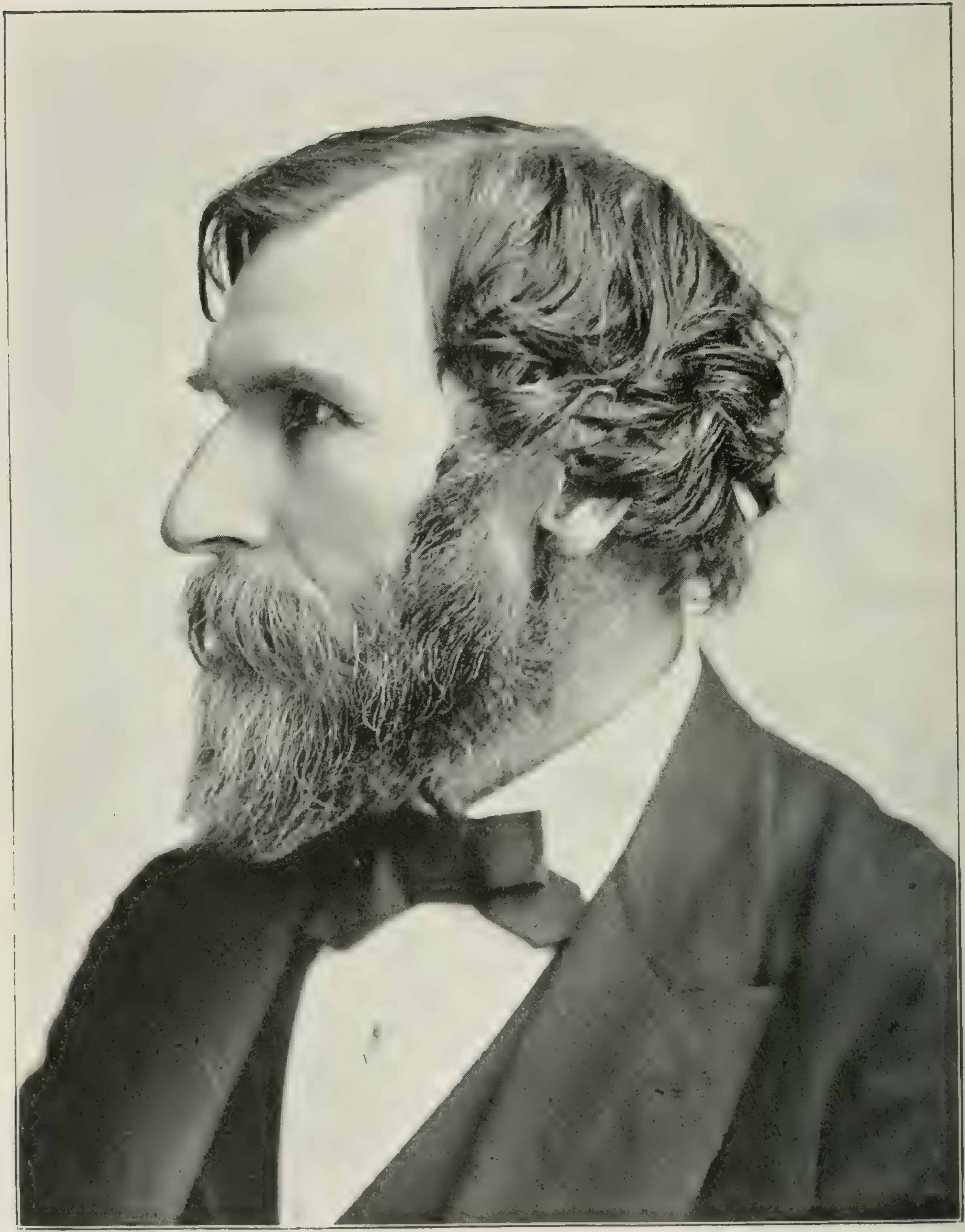
> WHY NOT OPTICS?
>
> Is there any reason why the Dentist should not combine the Optical profession? In many of the smaller cities and towns this combination could be made very advantageously; in fact it has been done in many cases and proven very profitable.
>
> "Dentistry and Optometry" is a consistent and suitable coalition, and the one can be cultivated to the mutual advantage of the other. The Dentist who is alive to his own interest can scarcely overlook this promising field.
>
> Our Correspondence Department will furnish the "know how" at small expense and without leaving home.
>
> DEGREES CONFERRED: *Graduate in Optics and Doctor of Refraction.*

The mayor of Buffalo, N. Y., who is a physician, has refused to grant licenses to peddlers to sell spectacles on the street. He holds that great injury might result to the eyes of the purchaser from glasses bought in such manner.

We read in the *Philadelphia Medical Journal* that every public and parochial school in Boston is subjected to a daily medical inspection. The city is divided into 50 districts for the purpose of medical visitation. Each visitor has from one to five schools to visit. Every teacher in the building is required to report to the master of all the schools there the case of every child who seems to be ailing. The question is, whether the child is ailing sufficiently to be sent home at once. If this is so, the sufferer is dismissed. In no case does the doctor interfere with the practice of the family physician. As to the results of the work, a report for one year says that 8,964 pupils were examined, and 1,156 were found to be too ill to remain in school. Out of this number 382 were eye diseases.

At a meeting of the *Section on Ophthalmology, College of Physicians*, Philadelphia held in January, Dr. George C. Harlan was elected chairman and Dr. Howard F. Hansell clerk of the section for the ensuing year.

Dr. Edward Jackson has been elected President of the *Philadelphia County Medical Society* for 1898.



DR. EDWARD L. HOLMES

THE

OPHTHALMIC RECORD

A MONTHLY REVIEW OF THE PROGRESS OF OPHTHALMOLOGY.

VOLUME VII. CHICAGO, MARCH, 1898. No. 3. NEW SERIES

ORIGINAL ARTICLES.

A CASE OF TARSITIS.*

BY H. GRADLE, M. D.,

OF CHICAGO.

Tarsitis is so infrequent that the report of a single case presenting some unusual features does not seem superfluous.

Mary McC., a healthy girl of 24 years, noticed a swelling of the right upper lid in January, 1897. She called at the dispensary of the medical school of the Northwestern University in February, and was treated for nearly four weeks by Drs. Starkey and Mann with corrosive sublimate and iodide of potassium in moderate doses. Early in March she was referred to me for clinical demonstration, through the courtesy of Drs. Starkey and Mann.

The disease had increased up to that time in spite of treatment. There was now a diffuse hard swelling of the tarsal plate of the right upper lid, with inflammatory œdema of the skin over it. The eye was almost completely closed, but could be opened by her own effort sufficiently for examination. There was uniform injection and slight inflammatory swelling of the palpebral conjunctiva, and this condition extended over the transition folds to the eyeball. The central part of the ocular conjunctiva was normal. There was no purulent secretion.

The girl did not admit any syphilitic history, and showed no present signs of infection. As mixed treatment had had no influence in checking the disease, I suspected that syphilis—if really the cause—might be of older date, and hence gave her increasing doses of iodide of potassium up to four grams, three times daily. But this, too, proved of no influence during the next four weeks. Yet the girl had syphilis, as I learned later on from Dr. Starkey, who had the kindness to correspond with Dr. S. M. Wylie, her former physician. This gentleman wrote that he had treated her for characteristic symptoms, and had traced the infection to the man from whom she had contracted it.

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* Read before the Chicago Ophthalmological and Otological Society, January, 1898.

After irregular attendance, but continued use of KI, the girl returned April 23d. The swelling was now so great that the eye could not be opened spontaneously. Yet there had never been any pain. The œdema and redness were limited to the upper lid, and the condition was somewhat intensified by maceration and abrasion of the skin, due, probably, to having kept the eye tied up with a handkerchief for a few days. There was now a moderate catarrhal secretion, and this had evidently been confined and spread over the skin by her improper bandage. Further observation showed later on that the skin was unusually vulnerable.

There was now well-pronounced catarrhal conjunctivitis, with congestion and slight chemotic swelling of the entire ocular conjunctiva, and moderate diffuse haze of the lower half of the cornea. V was reduced to $\frac{20}{80}$, but this was partly due to astigmatism, as was learned subsequently.

The inefficiency of specific treatment and a deceptive feeling of fluctuation led me to make an incision into the tarsus, expecting to find a cavity with necrotic contents. But no pus or necrotic tissue was found. A small dressing was so applied as not to close the lid, and the conjunctiva was brushed with 2 per cent solution of silver nitrate. The next day the inflammatory œdema of the skin and the chemosis of the ocular conjunctiva were markedly reduced, while the wound had closed completely. An effort was now made to heal the abraded skin of the upper lid by nitrate of silver and zinc-oxide-lanoline salve, while the conjunctiva was brushed daily. Within two days the skin had healed and the œdema still further diminished. During the next week the inflammatory condition of the conjunctiva and the corneal haze continued to improve, but the tarsal infiltration did not change. I then made again a deep incision and found, as before, a distinct improvement in the general tumefaction on the following day.

On May 10th, the eyeball and cornea were normal, and the catarrhal conjunctivitis much less pronounced. But the tarsal swelling had not changed within the last week. I now began the steady use of an ointment of pyrogallic acid (1 in 10 of lanolin) on the skin of the upper lid, continuing, however, the conjunctival applications. A very marked improvement was noticed within two days and continued for a week, when it was found necessary to stop the pyrogallol ointment, on account of abrasion of the skin. Within a few days the skin healed under oxide of zinc salve, but the tarsal swelling did not change any further. A week later the pyrogallol was resumed again with unmistakable influence on the tarsitis, but again it proved irritant to the skin. On discontinuing the salve the tarsal swelling remained stationary, but yielded a third time to the influence of pyrogallol, when resumed in June. By this time the lid had nearly regained its normal size and the eye could be well opened. There was scarcely any œdema and only moderate redness of the upper lid, but the tarsal swelling was still perceptible to the finger. As the pyrogallol stains the skin black, the color of the skin could only be judged during the intervals of treatment. The pyrogallol was continued at intervals during the month of June with further reduction of the tarsal swelling. I did not see her after the 19th of that month but she presented herself at the clinic off and on until the end of the month. Dr. Ritter reported her at the last examination as much improved, though not yet normal.

Although there are on record but twenty cases of tarsitis since first described by Magawly in 1867, the similarity in different observations establishes a well-characterized and typical form of disease. In all instances the disease was a manifestation of syphilis. In four cases (one each by Dietlen and by Fuchs,[1] two by Magawly) it occurred during the early period of infection and pursued a fairly acute course, while in all the others it belonged to the late stages and lasted months without acute symptoms. It is generally limited to the tarsus of one lid, either upper or lower, but in one of Fuchs' cases it involved upper and lower tarsus, while in another it attacked successively the two sides. A few times only part of the tarsus was enlarged. The enlarged tarsus is palpable and hard, but not tender. In most instances the skin of the lid seems to have been normal, or presented merely slight venous stasis. I make this statement with some reserve, since several of the published observations are contained in dissertations inaccessible to me. In my own case the skin remained in a state of œdema with intense congestion from the start until the end of our observation (similar to observation by Bull[2]). While in most instances the conjunctiva remained normal, there was inflammatory swelling with catarrhal secretion in a few, and several times redness and chemosis of the ocular conjunctiva was noted. In Reiner's[3] case the ocular conjunctiva was thickened, injected and infiltrated. The patient observed by me seems to have been the only one whose cornea was temporarily clouded. In all probability this was an indirect consequence, due to the intense catarrhal conjunctivitis and chemosis which had been aggravated by the injudicious use of the bandage. The retention of secretion thereby produced seems to account, too, for the abraded condition of the skin in April. But the skin was unusually vulnerable, as shown by the irritation set up by pyrogallic acid.

In several instances the loss of the cilia is mentioned. But as none of these were subsequently watched, it is uncertain whether the loss was permanent. In none of the reported cases was there any suppuration. But the tarsus underwent shrinkage in several instances, presumably with ultimate deformity.

All the chronic cases were of long duration. Even those with acute symptoms lasted one to three months. Perhaps the quickest course was seen by Bull, whose patient (with syphilis dating back four years) was cured by six weeks' use of mercury and potassium iodide. In all instances syphilitic treatment had a distinct influence, but many were not under observation long enough to be entirely cured. Why the treatment of four weeks' corrosive sublimate and iodide, followed by larger doses of iodide for another four weeks, failed to check the progress of the disease in the patient observed by me is not apparent. On the other hand, the influence of the pyrogallol ointment upon the tarsal swelling was very definite. The repeated intermissions in its use, necessitated by the cutaneous soreness, gave a still better opportunity to observe its effects.

Tarsitis is considered by several observers as a gummatous affection. Fuchs takes this view on account of the yellowish infiltrated appearance of the tarsus as it appeared in some instances through the transparent conjunctiva. There are, however, no anatomical studies on record. Still a gumma could scarcely be expected in those cases which occurred within a period of months after the primary infection. It seems also an improbable view in those instances in which the entire tarsus is uniformly thickened. Gummatous infiltration, too, yields as a rule quicker to specific medication—if it yields at all—than was the case in most recorded instances. Finally, Mittasch[4] who reports a case of diffuse syphilitic tarsitis, had the opportunity to observe in another patient a gumma of the tarsus, and found the latter a circumscribed tumefaction with characteristic breaking down and ulceration, which was rapidly influenced by specific treatment.

[1] Fuchs. *Zehender's klin. Monatsblätter f. Augenhlkde*, 1878.

[2] Bull. *Transactions of the Am. Ophthalm. Society*, 1878.

[3] S. Reiner. *Deutschman's Beitr. z. Augenheilkunde* Heft xxiii. 1896.

[4] H. Mittasch. *Inaug. Dissertation.* Würzburg, 1883. Abst. *in Nagel's Jahresbericht*, 1883. Comp. also *Alexander. Syphilis und Auge.*, 1889.

DR. SAVAGE'S DIRECTION THEORY.

BY DAVID W. STEVENSON, M.D.

RICHMOND, INDIANA.

Illustrated.

It must be a matter of great surprise to the student to find one, who has given us many good things in ophthalmology, still clinging to a projection theory so utterly erroneous and at variance with all the foundations of geometrical optics. "Every line of direction is a radius of retinal curvature prolonged," says Dr. Savage, in the OPHTHALMIC RECORD for January of this year; or, as he has stated it in his *New Truths*, "Every object seen must be on a line vertical to that part of the retina receiving the impress of light, regardless of the direction of the axial ray in the eye." If the retina were flat (as is possible in detachment), and similar to the sensitive plate in the photographer's* camera, to state that points on the surface, if projected at right angles into space, would be in line of direction of objects, is a hypothesis so at variance with truth that even Dr. Savage may probably disown his own theory at once.

Dr. Savage takes such liberty with his drawings that it may be in place to imitate him in this matter, and thus show his theory to be visibly wrong in a figure, even to himself and readers. The only liberty I have taken is to represent in a myopic eye the ciliary body as much lengthened, and the retina of small curvature. According to his theory the projection of 2 would pass out almost at right angles to the eye axis. I may here state that if the part of the retina at the macula was not at right angles to the optic axis, the impression at the macula would not obey his projection theory even there.

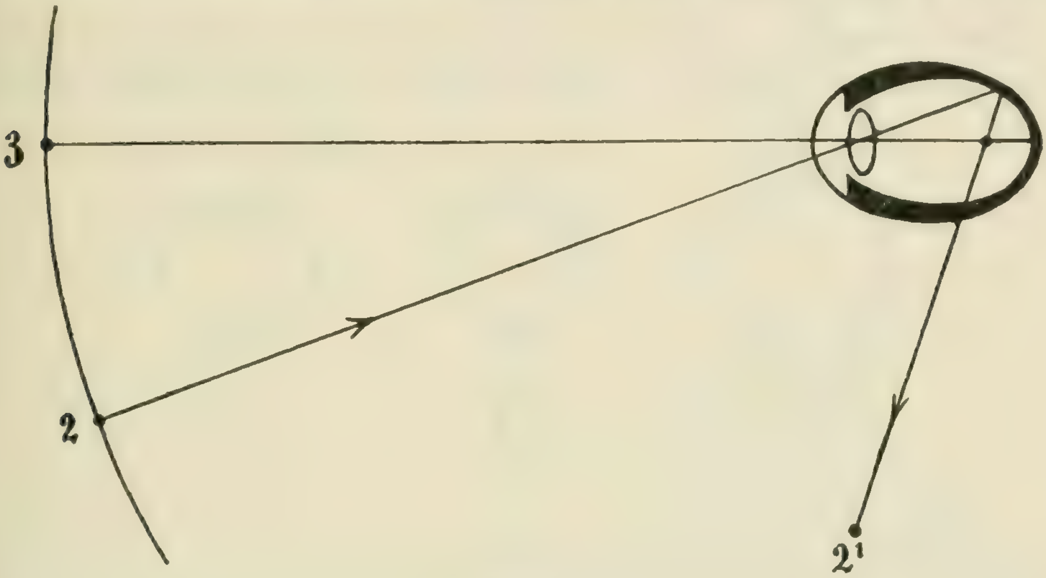

Figure I

Dr. Savage does not seem to differentiate between *principal axes*, *secondary axes* and *marginal rays*. Thus he speaks of the *marginal ray* b c d in his Fig. 2 as an axial ray, which moves the nodal point forward. B c d s not an axial ray, not even a secondary axis. Take the case of an eye with a broad almost total leucoma, for which a marginal iridectomy has been done. In such an eye a principal axis cannot pass into the eye. Only marginal rays can, and marginal rays are not supposed to go through nodal points. We can suppose an axis to pass through the leucoma, just as we can suppose it to pass through the sclerotic; moreover, we have to remember that a secondary axis is not a straight line, but it only means that the incident and emergent rays are parallel to each other. There are two nodal points in the eye, and the Gausserian theory is that the incident secondary axis lies in line with the first nodal point (not passes through it), and conversely the emergent ray is in line with the second nodal point.

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* It would be idle to hint to a photographer that if he used sensitive films bent either convex or concave, or even flat, that it would affect the optical center of his lens or its nodal points.

Dr. Savage represents in his Fig. 5 an incident and emergent ray of secondary axes passing through the nodal point, and yet they are not in line or parallel. What liberties he takes in his diagrams! The nodal point or points have not a fixed location in the eye. For oblique rays can have a different nodal in the eye which is not of regular curvature. Also, in astigmatism, for one meridian the nodal point may be in a different location from another meridian.

Thus in the Figures A, B, C is shown what might be the different retinal images of a CIRCLE in a case of simple myopic astigmatism in the vertical meridian. Suppose the astigmatism is with the rule, and the horizontal meridian is emmetropic. It will be noticed that A, B, C have all the same width. For the case A the astigmatism is in the cornea, and the ophthalmometer shows the vertical meridian to be more convex. In this case the nodal points for the vertical meridian will be nearer the corneal apex than for the horizontal emmetropic meridian. For Fig. C the astigmatism consists of a greater vertical curvature in the posterior surface of the lens. This will move the nodal point for the vertical meridian farther back from the corneal apex, and the vertical image of a circle will be shortened. In Fig. B is a case where the astigmatism is divided between cornea and lens so that the nodal point for the vertical meridian lies in the same location as for the horizontal emmetropic meridian. In this case the image of a circle can be circular, but with some blurring at top and bottom. Most astigmatic persons notice this blurring a great deal, but hardly ever notice any elliptical curve to a circle. But Dr. Savage's law has no reference to the anterior parts of the eye, and his

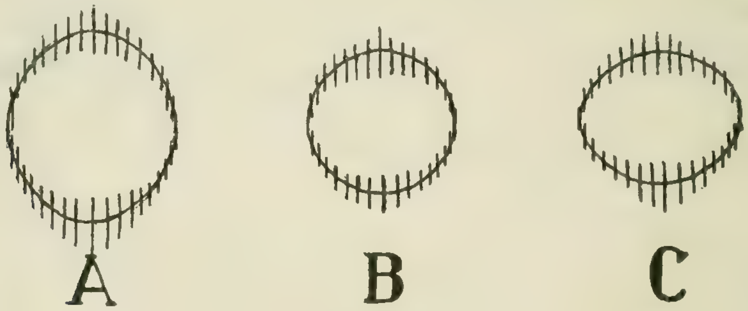

Figure II.

rule might thus be worded: Lines drawn from the extremities of an object and through the center of retinal curvature will give the size and image of an object without any reference to the dioptrics of the cornea or lens. If that were the case the Figures A, B and C would all be alike. Dr. Savage in his Fig. 2 has drawn a diagram representing an eye having a temporal field of 115°, if measured from front of cornea. Yet with

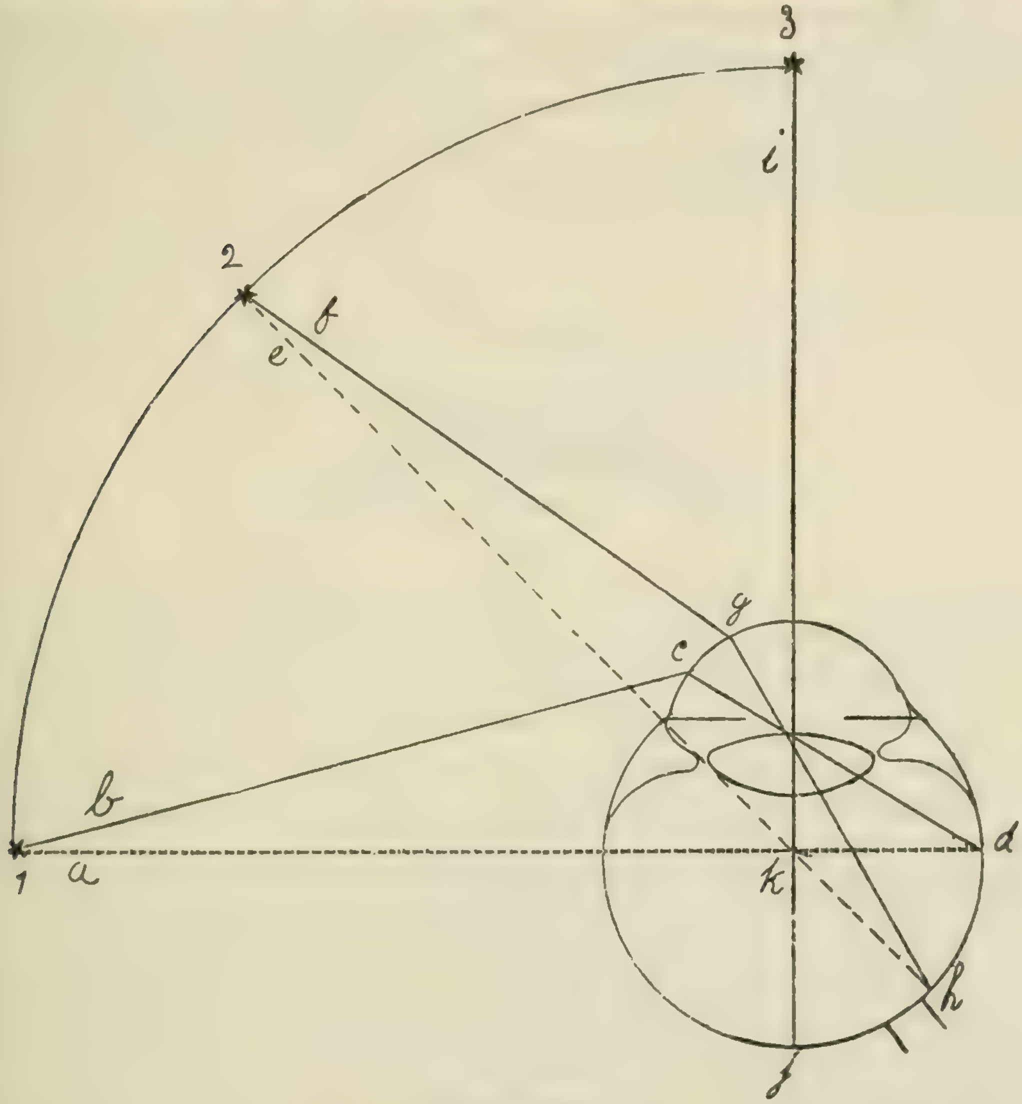

Figure III

this very large and impossible angle, the image of the object only comes to the equator of the retina. If he had drawn it through the nodal points for marginal rays it would have reached to the extreme limits of the retina where it belongs. If in Fig. 2 he would extend the line Ka for a distance of ten feet, the object would then make about an angle of 90° with the axis of the eye at the cornea. But, suppose he brought the object within an inch of K, on the line of Ka, this would give the object a temporal angle of 130°, with the axis measured from the cornea. Yet Dr. Savage would have us believe that an object with an angle of 90° would come to exactly the same focus as an object at 130°, and that on the equator of the retina. I may just state here that the center for a perimeter is supposed to lie at the nodal points, and NOT at the retinal center.

As to his Fig. 3 it is wrong in conception. In a case of progressive myopia the images get larger as the retina recedes. But the retina is fixed at the macula, and therefore more of the retina is covered than before, hence the subject imagines the object larger than before, and the projection appears bent away from the axis, which is easily understood by lines drawn through nodal points.

VAN MILLINGEN'S OPERATION FOR THE RELIEF OF TRICHIASIS AND ENTROPION.

BY DR. EDWIN VAN MILLINGEN,
OF CONSTANTINOPLE, TURKEY.

Illustrated.

Grafting foreign tissue on the intermarginal space for the cure of trichiasis was first tried by me in 1872. It struck me at the time that the most marked pathological change in trichiasis was the obliteration of the intermarginal space. This change had to be remedied. My first experiments in this line were identical with those of Spencer Watson, first published in 1874, and it appears that we had been working independently of one another. It will be remembered that his operation consisted in the transposing of two triangular flaps at the outer canthus, the one, a ciliary flap, taking the place of the other, a skin flap, and vice versa. This method gave fair results in cases of angular trichiasis, but was always followed by more or less disfigurement. Dissatisfied with the method, I tried grafting with mucus membrane from the mouth of the rabbit, but I finally gave the preference to membrane taken from the patient's lip. I first described this operation in a report of three years' practice published in 1880[1]. This paper was quoted in Nagel's *Jahresbericht* in 1880, but no notice was taken of the operation. My next publication on the subject appeared in 1887[2]. I have never formally claimed priority for the method, simply because a like operation has never been proposed by anyone before or after me, but I willingly accept my friend, Dr. Casey Wood's kind offer to allow me some space for this subject in the RECORD.

The operation is indicated in all forms of trichiasis, whether partial or total (partial trichiasis always becoming total in time), whether combined with incurvation of the tarsus or not. Of late years I have applied the methods for trichiasis of the lower lids and have gradually put aside the other methods, including Hotz's, which I always found to be the best for the lower lids. Narcosis is generally indispensable. The parts having been thoroughly cleansed according to rule, a spatula should be pushed under the upper lid, the free margin of which must then be everted by combined pressure and traction with the index and thumb of the left hand, the pressure being brought to bear downwards on the spatula and the traction upwards. This action produces hemostasis and exposes the intermarginal space. Snellen's clamp stretches the lid too much and does not allow the operator a good view of the intermarginal space. The spatula should then be held by an assistant, whose duty it is to push it up against the fingers of the operator, the spatula being used as a lever with the cheek bone as a fulcrum. Before incising the margin, it is well to remember that the eversion of the lid has so displaced the hair bulbs of the cilia, that in cutting down at right angles to the surface of the marginal space the roots will be divided, one half remaining above and the other half below the section. To avoid this, the knife should be placed obliquely to the surface of the intermarginal space, the handle of the instrument leaning towards the eyebrow of the patient. The next step, then, is to trace a line with the point of the knife from one end of the intermarginal space to the other, cutting throughout in the middle line and avoiding the deviated cilia, which should all be left above the incision. This superficial incision should begin close to the outer canthus and end close to the punctum. This done, a number of incisions should be made in the tissue underlying the first incision, which is that of the free margin of the tarsus. The knife being held as above advised, each incision will be seen to widen the wound surface without grooving or cleaving the lid, as for instance in

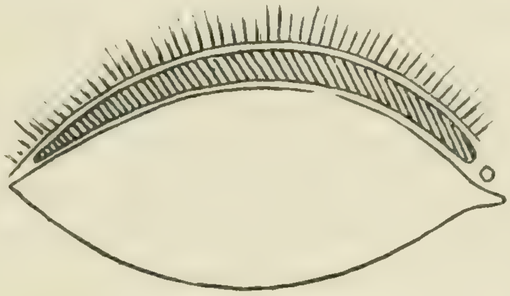
Fig. 1.

Arlt's operation. The success of the operation depends greatly on the form given to the wound surface, which should be flat throughout and shaped as in Fig. 1. A lozenge-shaped wound must be stringently avoided. The breadth of the wound must not exceed 2mm. The next step is the "reefing" of the eyelid for securing immobility after the operation. Three sutures are generally enough for the purpose. Each thread should be passed through a fold of skin close to the interior margin of the eyebrow, and then again through a thin fold of skin not nearer than 1mm. to the row of cilia. The sutures should then be knotted, sufficiently tight to keep the lid drawn up and the wound lips apart, without producing too much ectropion. The spatula having been removed, the wound should be covered with cotton wool soaked in a cold solution of sublimate until the strip of lip is ready.

The excision of the strip of lip is performed with a pair of scissors bent on the flat and a fixation forceps. A thin fold of the inner surface of the under lip just where it commences to present the appearance of mucous membrane, is taken up between the teeth of the forceps, and the excision of the strip is easy if the operator starts cutting with the angle of the branches of the scissors and not with the point. The flap is raised as the scissors advances until a strip of 15mm. in length and about 2 in breadth has been excised. The strip is then laid with its mucous surface on a plate or glass, and any fatty of knotty tissue on its raw surface excised. The sides of the flap should also be paired down with a sharp razor until it is brought to the shape of the wound in Fig. 1. The strip should be thin, semi-transparent, and even throughout. It should then be implanted in the intermarginal space and pressed down with a pad of cotton wool soaked in sublimate lotion. If the pad is very soppy the flap will not adhere to it when the pad is withdrawn. The bleeding generally ceases after the apposition of the flap. When this has been completed, a flap of linen spread with iodoform vaseline should be placed over the eyelid and both eyes bandaged. The bandage should be removed carefully after 48 hours, and the stitches also. The wound in the lip should be sutured and covered over for a few hours with cotton wool and sublimate lotion.

In operating on the lower lids a very narrow slit should be made on the intermarginal space, and a very narrow strip of lip not exceeding 1m. in breadth applied. Even narrower strips will do as well.

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[1] Page 134.

[2] *Ophthalmic Review*, November, 1887.

ON THE NECESSITY FOR REPEATED EXAMINATIONS IN THE CORRECTION OF ERRORS OF REFRACTION.

BY CASSIUS D. WESCOTT, M.D.
Instructor in Ophthalmology at Rush Medical College, etc.
CHICAGO.

Very early in my experience in refraction work, when cycloplegics were not so generally used as now, I became impressed with the fact that single examinations, after any number of applications, either of atropin or homatropin, were unreliable in very many cases, and for a time discarded homatropin altogether, after having an opportunity to examine a few patients under atropin, whose refraction I had previously measured with the aid of homatropin. In 1888 I began to urge all my patients, under forty years of age, to submit to examination under atropin if possible, and adopted a plan, which I still find satisfactory, and which is as follows:

After a careful preliminary examination, including the use of the ophthalmoscope, I order a solution of sulphate of atropin, four grains to the ounce, two drops of which is to be put into each eye three times a day. After the drops have been used one day the patient comes for the first test. I first estimate the amount of error as closely as possible with the ophthalmoscope, and I am so fortunate and get results so quickly by this method that I seldom resort to retinoscopy, although I am well aware that many of my colleagues, who are more skillful than I, obtain more accurate measurements with the retinoscope. I then proceed to the examination with the test lenses, guided by the results obtained with the ophthalmoscope. I use Dr. Risley's optometer in all cases, and observe as great care as I should if I were to depend upon one test alone. After noting the correction, I dismiss the patient with instructions to continue the use of the atropin and come the next day. On the following day the subjective test is repeated with the same care, and as my lenses vary by eighths of a diopter up to two diopters, I am as accurate as the power of discrimination of my patient will permit. These daily examinations are continued until the measurements obtained on two successive days absolutely agree. The first two tests rarely give me the same result.

The following extracts, taken at random from my records, illustrate my point and show variations which, while small, I believe to be of sufficient importance to warrant the time and trouble taken to eliminate them and to secure what I believe is the absolute refraction error :

CASE I. Mr. J. F. R., Student. Aged 24.

First day.	L.			+0.25 Cyl.	Ax. 90°	V. 20/20.
	R.			+0.25 Cyl.	Ax. 90°	V. 20/20.
Second day.	L.			+0.75 Cyl.	Ax. 90°	V. 20/20.
	R.	—0.25	S.	+0.62 Cyl.	Ax. 90°	V. 20/20.
Third day.	L.			+0.62 Cyl.	Ax. 90°	V. 20/20.
	R.	—0.25	S.	+0.88 Cyl.	Ax. 90°	V. 20/20.
Fourth day.	L.			+0.62 Cyl.	Ax. 90°	V. 20/20.
	R.	—0.25	S.	+1.00 Cyl.	Ax. 90°	V. 20/20.
Fifth day.	L.			+0.62 Cyl.	Ax. 90°	V. 20/20.
	R.	—0.25	S.	+1.00 Cyl.	Ax. 90°	V. 20/20.

CASE II. Mr. F. M. D., Photographer. Aged 33.

First day.	L.			—1.75 Cyl.	Ax. 180°	V. 20/50.
	R.			+1.25 Cyl.	Ax. 90°	V. 20/40.
Second day.	L.			—2.00 Cyl.	Ax. 180°	V. 20/50.
	R.	—0.50	S.	+1.75 Cyl.	Ax. 75°	V. 20/40.
Third day.	L.			—1.75 Cyl.	Ax. 180°	V. 20/50.
	R.	—0.50	S.	+2.75 Cyl.	Ax. 75°	V. 20/30.
Fourth day.	L.			—2.00 Cyl.	Ax. 175°	V. 20/50.
	R.			+2.75 Cyl.	Ax. 60°	V. 20/30.
Fifth day.	L.			—2.00 Cyl.	Ax. 175°	V. 20/50.
	R.			+2.75 Cyl.	Ax. 60°	V. 20/30.

CASE III. Mr. Will S., Student. Aged 19.

First day.	L.			—0.50 Cyl.	Ax. 180°	V. 20/20.
	R.	—1.00	S.	—0.25 Cyl.	Ax. 180°	V. 20/20.
Second day.	L.			—0.37 Cyl.	Ax. 180°	V. 20/20.
	R.	—0.88	S.	—0.25 Cyl.	Ax. 180°	V. 20/20.
Third day.	L.			—0.25 Cyl.	Ax. 180°	V. 20/20.
	R.	—0.50	S.	—0.25 Cyl.	Ax. 180°	V. 20/20.
Fourth day.	L.			—0.25 Cyl.	Ax. 180°	V. 20/20.
	R.	—0.50	S.	—0.25 Cyl.	Ax. 180°	V. 20/20.

CASE IV. Mr. D. A. D., Clerk. Aged 23.

First day.	L.	+1.00	S.	—2.25 Cyl.	Ax. 180°	V. 20/30.
	R.			—0.75 Cyl.	Ax. 180°	V. 20/20.
Second day.	L.	+0.75	S.	—2.00 Cyl.	Ax. 175°	V. 20/30.
	R.			+0.37 Cyl.	Ax. 105°	V. 20/20.
Third day.	L.	+1.00	S.	—2.00 Cyl.	Ax. 175°	V. 20/20.
	R.			+0.37 Cyl.	Ax. 105°	V. 20/20.
Fourth day.	L.	+1.00	S.	—2.00 Cyl.	Ax. 175°	V. 20/20.
	R.			+0.37 Cyl.	Ax. 105°	V. 20/20.

CASE V. Miss F. W., Student. Aged 19.

First day.	L.	+0.75	S.	+0.25 Cyl.	Ax. 180°	V. 20/20.
	R.	+0.75	S.	+0.25 Cyl.	Ax. 90°	V. 20/20.

Second day.	L.	+0.75 S.			V. 20/20.
	R.	+0.75 S.			V. 20/20.
Third day.	L.	+0.75 S.			V. 20/20.
	R.	+0.75 S.			V. 20/20.

In each of the above cases I prescribed glasses on the basis of the final correction, to be worn constantly, and in each instance they have been used with comfort and relief. In Case V, I prescribed +0.50; in the others, the full correction.

CASE VI. Mr. W. V. G., Student. Aged 27.

Homatropin and Cocaine:					
	L.		+0.37 Cyl.	Ax. 105°	V. 20/20.
	R.		+0.25 Cyl.	Ax. 90°	V. 20/20.
Atropin:					
First day.	L.	+0.25 S.	+0.25 Cyl.	Ax. 105°	V. 20/20.
	R.	+0.37 S.	+0.37 Cyl.	Ax. 90°	V. 20/20.
Second day.	L.	+0.25 S.	+0.25 Cyl.	Ax. 90°	V. 20/20.
	R.	+0.37 S.	+0.25 Cyl.	Ax. 90°	V. 20/20.
Third day.	L.	+0.25 S.	+0.25 Cyl.	Ax. 90°	V. 20/20.
	R.	+0.37 S.	+0.25 Cyl.	Ax. 90°	V. 20/20.

CASE VII. Mr. M. A. A., Student. Aged 21.

Homatropin and Cocaine:					
	L.		+0.62 Cyl.	Ax. 75°	V. 20/20.
	R.	+0.50 S.	+0.25 Cyl.	Ax. 90°	V. 20/20.
Atropin (third test):					
	L.	+0.25 S.	+0.37 Cyl.	Ax. 60°	V. 20/20.
	R.	+0.50 S.	+0.25 Cyl.	Ax. 90°	V. 20/20.

CASE VIII. Dr. N. B., Physician. Aged 51.

Without cycloplegic:					
	L.	+0.50 S.	+0.62 Cyl.	Ax. 60°	V. 20/20.
	R.	+0.25 S.	+0.50 Cyl.	Ax. 75°	V. 20/20.
Homatropin and Cocaine:					
	L.	+0.75 S.	+0.62 Cyl.	Ax. 60°	V. 20/20.
	R.	+0.75 S.	+0.50 Cyl.	Ax. 90°	V. 20/20.
Atropin (third test):					
	L.	+0.88 S.	+0.62 Cyl.	Ax. 60°	V. 20/20.
	R.	+1.00 S.	+0.25 Cyl.	Ax. 90°	V. 20/20.

Cases VI, VII and VIII show the comparative results of examinations made under atropin and homatropin. In Cases VI and VII the atropin was used on the days immediately following the examination under homatropin, and in Case VIII within three weeks. I use a solution of homatropin and cocaine, ten grains of each to an ounce of salicylated water, and have one or two drops applied in each eye every five minutes until six applications have been made. After an hour and a quarter to an hour and a half from the time of the first application I make a careful test, and repeat it on the following day if I can.

Case VIII illustrates well the impossibility of accurately correcting some cases of astigmatism, even in presbyopes, without the use of a cycloplegic, and in this instance I used atropin and made a number of tests on different days, because the glasses previously ordered without the use of a cycloplegic, and also after a careful examination under homatropin, had been unsatisfactory. In the selection of these examples I have purposely avoided cases of children in which the variations are often much greater.

We cannot always do our best for our patients, and I am frequently obliged to prescribe glasses for young adults after a single examination under homatropin, but I always do so under protest, believing, as I do, that the only way in which to bring out the absolute error is to repeat our tests day after day with the aid of a less transient cycloplegic, until we get constant results.

Unless there is some very good reason for not doing so, I use homatropin in the examination of all patients over fifty years of age, and make two tests if possible. I have had no cause to regret the practice, but on the contrary the results have been most gratifying. I am often surprised at the amount of latent trouble which the cycloplegic develops in old people.

31 Washington Street.

DERMOID CYST OF THE ORBIT.*

BY H. MOULTON, M. D.
FORT SMITH, ARK.

Dermoid cysts of moderate size and situated around the margins of the orbit, especially at the outer end of the brow (Nettleship), are not uncommon. They are, however, quite rarely found within the orbit itself. Unlike the periorbital cysts, these intra-orbital cysts are found in a majority of the cases in the nasal side of the orbit. (Berlin.)

In June, 1895, Dr. B. L. Milliken (*Arch. Oph., Vol. XXIV*, p. 356) says that Berlin in 1880 had collected all the recorded cases he could find, amounting to seventy-three. "It is doubtful if twenty-three of these were genuine." Milliken collects thirteen more from literature since 1880, and records one interesting case himself. In his case the tumor was above the eyeball, the rarest situation of all, and of considerable size, containing more than half an ounce of fluid and some hairs. The eyeball and its vision were retained after the operation, and the orbit appeared to be somewhat enlarged with its upper margin thickened and rounded off. This is the only case I know of where the development of the orbit was interfered with, excepting my own, in which the developmental changes were vastly greater.

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*Read before the Arkansas Medical Society at Little Rock, in May, 1897.

The patient, a married man, aged thirty-two, healthy and a resident of the Indian Territory, had a tumor under his left eye which had been present from his earliest recollection. It had gradually increased in size during his earlier life so that when I first saw it, it seemed to fill the entire orbit, protruding beyond the margins, extending downward on the cheek and crowding the eyeball almost out of the orbit under the outer end of the upper lid, where it lay concealed from view. It was covered by the stretched tissues of the lower lid and by the skin and fascia of the cheek. It was sensitive to pressure and painful, a symptom which had been present only during the past few weeks, and was at times so severe as to require the administration of morphine for its relief.

This was the real cause of his applying for advice. In the absence of other inflammatory symptoms, and because the patient was not conscious that the umor had lately increased in size, I was at a loss to account for this pain; but it was probably due to pressure consequent to a slow and imperceptible increase in size. On lifting the upper lid, enough of the eye could be uncovered to show an intact cornea, a ball slightly movable in all directions, but turned decidedly upward, and a mobile pupil with V–fingers at 2ft.

On January 24, 1896, the patient was anesthetized at the hospital by Dr. Hatchett with the A. C. E. mixture. A long incision from one canthus to the other was made across the lower lid, and another from the middle of this downward onto the cheek, and the flaps carefully dissected away from the growth. Before beginning the operation it was very doubtful whether the sense of fluctuation imparted to the finger was genuine, so great was the tension and hardness of the tumor. But now the cystic character became fully evident. Owing to its great size and firm adhesion to the lower margin of the orbit, I did not hope to be able to remove the cyst without rupture, but proceeding slowly and carefully, was enabled to separate it from the tissues above and on each side back nearly to the apex, being obliged to cut at the same time the inferior rectus muscle. On attempting to dissect it from the bony floor, it was ruptured and a gruel-like, inodorous substance, composed of epithelial debris escaped, estimated at about three fluid ounces. The sac extended fully to the apex of the orbit and was removed as completely as possible. All doubtful areas were thoroughly scraped.

The eyeball, now fully in view, was seen to be diminutive in size, being not more than half or two-thirds as large as a normal eye, and no attempt was made to preserve it in an orbit as much too large as it was too small. But at this point the patient's breathing and heart action became so bad that we had to cease operating and administer hypodermatic injections of whisky and strychnine. We also had to employ artificial respiration for about five minutes. Then, with two or three snips of the scissors, the eyeball lay upon the table. The wound in the lid and cheek was closed with silk sutures; the orbit was irrigated, packed with iodoform gauze and covered with a compress and bandage. Strict antisepsis was observed throughout, but the intra-orbital surfaces uncovered were too extensive to be recovered again by skin or mucous membrane, and healing was partly by granulation, though rapid and uneventful. The tumor has not recurred and will not, for when a recurrence does take place in these cases, it is usually within a very short time after the first operation.

The measurements of the orbital circumference were taken and are as follows: Vertical diameter, 45 mm.; horizontal diameter, 47 mm. Of the opposite orbit the vertical diameter is 30 mm., the horizontal 37 mm.

That this enlargement of the cavity to nearly double the size of its fellow was due to developmental changes and not to absorption, is evident, I think, for the dilatation extended in all directions, involving the deeper portions as well as the rim, and, excepting the normal openings at the apex, there was no solution of continuity of the walls. A very slight degree of absorption would have perforated some of the deeper portions of the walls, especially the roof. To produce this over-development, it is probable that the tumor attained considerable size in very early life before ossification became complete and before the sutures were firmly united.

Halliwell Building.

OPHTHALMIA NEONATORUM.

BY ALLEN GREENWOOD, M. D.

OF WALTHAM, MASS.

The editorial in the September number of the RECORD and the letter from Dr. Lucien Howe in the December number, have probably awakened a good deal of interest in this subject. I have been particularly interested on account of having just had three severe cases under my care simultaneously.

The first case I saw October 29, 1897, in consultation with a local practitioner. The infant was a month old and had been afflicted since it was three days old, but the trouble had been held in check by the occasional use of a weak solution of nitrate of silver until two days before, when it had become much worse. I found the conjunctival sacs filled with creamy yellow pus with great swelling of the palpebral conjunctivæ and to such an extent in the left eye that attempts to raise the upper lid only resulted in a rolling out of the congested conjunctiva, which was covered with a fibrino-purulent deposit and bled at the slightest touch. The cornea of the right eye showed a very slight central ulceration, but that of the left eye was destroyed down to Descemet's membrane, which was bulging forward but not perforated. The infant was immeditaely removed to the Waltham Hospital, where the eyes could be washed out every half hour with a warm 3 per cent. solution of boric acid and atropin instilled daily. After each irrigation vaseline was put between the lids. Under this treatment and the daily application of silver nitrate solution, twenty grains to the ounce, the discharge of pus gradually ceased. No further destructive process took place, and the cornea of the left eye was replaced by a dense leucoma with adherent iris. The right cornea cleared up entirely. A coverslip smeared with the pus showed the gonococcus.

The second case I saw October 31st, three days after birth, when I found both eyes infected. the lids being intensely hyperæmic and swollen with rolling out of the reduplicated and congested palpebral conjunctivæ on attempts to evert them. Conjunctival sacs filled with yellow pus and the surfaces of the conjunctivæ covered with a fibrino-purulent deposit resembling a false membrane, the removal of which was apt to cause bleeding. Coverslip smears of the pus showed Neisser's gonococci in great abundance, free and in the pus cells. Half-hourly cleansing of the conjunctival sacs with 3 per cent. solution of boric acid and the daily use of weak nitrate of silver solutions at first, but as the acute symptoms subsided increased in strength up to thirty grains to the ounce, gradually brought about a cessation of the discharge without there having been any corneal involvement.

The third case I saw November 15, 1897, two days after the birth of the child, in the maternity ward of the Waltham Hospital. Both eyes were affected, and the case in severity and every other way resembled the second. Coverslip smears showed many gonococci. In this case the nitrate solution was used finally, as strong as forty grains to the ounce, and in possible future cases I shall try using it still stronger, of course, neutralizing the excess of nitrate with salt solution. This case also cleared up without corneal involvement.

The constant and thorough cleansing of the conjunctival sacs to prevent retention of pus, is, in my mind, the surest preventive of corneal trouble.

One of these infants has lost the use of one eye, but if they had been neglected as such cases often are, it is probable, from the intensity of the infection, that the undisturbed action of the pus would have destroyed the eyes. When, therefore, it is realized what rapid and complete destruction of sight may result from this infection, it seems almost criminal to neglect a practically sure and harmless prophylactic treatment in any case of childbirth where there is the *slightest suspicion of a possible infection with gonococci.*

I would not, however, go so far as to advocate that Crédé's method *must* be applied "to the eyes of every living infant at the time of birth," but would suggest its compulsory use in all public institutions, and that it be made the rule in all hospital and dispensary practice.

In the three cases briefly reported, the causative agent was shown to be the gonococcus, and this germ can be demonstrated as the cause in practically every case of ophthalmia neonatorum.

Now it must be true that every family physician has many families in which he can feel perfectly safe in omitting any prophylactic measures against the diplococcus of Neisser. This is, of course, particularly true in country practice, and I doubt not that there are many country physicians who have never seen a case of ophthalmia neonatorum in their practice. Such being the case, it cannot be expected that the large body of general practitioners will kindly accept any attempt to enforce the compulsory use of a method that they may never see any cause for.

Knowing the causative agent in these cases, the efforts of the ophthalmologists should, it seems to me, be directed to teaching obstetricians and general practitioners the advisability and *necessity of the use of Credé's method in all public institutions and hospitals, and in all forms of dispensary practice.* Also in private practice in all cases where there is the *slightest suspicion or possibility of maternal infection with the diplococcus*, leaving its use in that large class of clean desirable cases to the discretion of the attending physician.

PARALYSIS OF LEFT EXTERNAL RECTUS.—CURED BY ELECTRICAL AND OPERATIVE TREATMENT.

BY S. J. BUMSTEAD, M. D.
OF DECATUR, ILL.

Mr. W—. K—., a young man about twenty-seven years of age, consulted me February 23, 1897, about a diplopia that he discovered on arising a few mornings before. His wife had been ill for several weeks, and he was frequently obliged to get up in the night to minister to her needs. On this particular occasion she aroused him out of a sound sleep, and while attending to her he felt confused and walked with some difficulty.

He noticed vertigo, but in a moment or two he had finished his slight task and was soon sound asleep again. In the morning he found homonymous diplopia with parallelism of objects in the left three-quarters of the visual field. Paralysis of the left external rectus muscle seemed complete. Both eyes were normal, and the ophthalmoscope threw no light upon the case. His head was turned slightly to the left, while his face and eyes were directed to the right in order to avoid the diplopia as much as possible.

There was not the least ground for suspecting syphilis in this case, nor was he a rheumatic subject, yet it may have been a rheumatic paralysis. A clot of blood from the ophthalmic vein also occurred to me. With the hope of allaying a rheumatic paralysis, quieting a neuritis, or promoting the absorption of a clot, kali iodide was given three times a day, in ten-grain doses, for four weeks. Then for three weeks strychnin, $\frac{1}{30}$ grain doses, one day one dose, the following day, two doses, was given.

About two weeks after the appearance of the trouble the daily use of the galvanic current was begun, applying the cathode to the region over the muscle, through the lids, interrupting the current, and this was continued steadily for more than three months. Several times the eye was cocainized and the cathode applied over conjunctiva, when at last one could see that the muscle contracted. During this period there was no development of any disease, of which this might have been a symptom. The muscle had distinctly been restored to some contractility, and yet single vision could only be brought within 15 or 20 degrees of the center of the binocular field. All efforts failed to extend this to the left. Under the influence of cocaine the position of the outer edge of cornea in vision to left of field was carefully marked on lower lid, then seizing the conjunctiva over the external rectus with forceps, the globe was swung to the left while the patient fixed a lighted candle fifteen feet distant. With the other hand ready, another mark was made on the lower lid the moment he recovered single vision some distance to left of median line. The distance between the two marks (4 millimeters) was taken as the measure of shortening that might restore single vision.

The muscle had certainly been restored to contractility, yet by reason of the greater power of the internal rectus, same eye, it could not regain its former power over the eye. Four months having been spent with above insufficient result, I decided to try operative measures.

The tendon was exposed by a vertical and horizontal incision in conjunctiva, connecting just below the insertion of the tendon. This rectangular flap was dissected up and laid above the scene of operation. The tendon was then loosened from its bed, for a little further than 4 mm. from its insertion and raised upon two hooks. A fine curved needle with 00 catgut attached was then passed through tendon, from without inward, close to the sclerotic, and near upper edge of tendon. The needle was next brought through the tendon just 4 mm. from its insertion, and from within outward, near edge of tendon. Again the needle was passed through tendon at this point, a millimeter or two from the first penetration of it, from outwardly to within, and this was repeated several times in order to get a firm hold of suture upon tendon. The last time leaving the catgut underneath tendon, when the needle was brought through its insertion in sclerotic, from within outward and near the lower edge. Then the two ends were gradually drawn upon, when the tendon folded itself nicely and became shorter by 4 mm., and the ligature was then firmly tied. The conjunctiva was next brought down and sutured in place. With only passing suture once out and once inward, as some have advised, I found it slipped and would not make the fold as desired, hence I retraced my steps, and sewed the tendon through and through several times, when there was no further trouble.

A few days later diplopia was to be found only in the left 45° of the field. Even at the end of a week this was the extent of the gain, 60° or 65° of the field to single vision. While this was a great gain it was not enough, so my attention was turned to the internal recti. I was not sufficiently impressed with the dictum of the authorities to attack the associate internal rectus, so I cut down upon that of the same eye, the opponent, and severed it, excepting the long, superior and inferior guy fibres. Soon after this the diplopia disappeared from the whole field, and has continued this way now four months.

The patient continues his occupation without glasses of any kind, and did so all this time, excepting about two weeks following first operation, July 6, 1897. The hump caused by the tuck in the tendon completely disappears, as stated by Valk and Savage.

PRIMARY SARCOMA OF THE EYELID.*

BY CASEY A. WOOD, M. D.,
OF CHICAGO.

Sarcomatous tumors of the eyelids are so exceedingly rare that I make no apology for presenting the following short history. Most English authors pass the subject over with but bare mention of the possibility of their occurrence, and even the transactions of the various ophthalmological societies rarely contain the history of an example. A very good account of these growths in the lid is given by Graefe, under the title Cylindroma (proposed by Billroth), in Vol. X, 2, p. 184, of his own *Archiv.* In the *British Medical Journal* for 1870, page 161, Samelson describes a case of sarcoma of the lid in a child ten months old. Schirmer gives an account (*Klinische Monatsblätter für Augenheilkunde*, Vol. I, p. 162) of multiple sarcomata affecting all four lids in a patient seventy years of age. Hirschberg also reports an example of this disease, in which there was a recurrence shortly after removal.

Baby A., aged 7 months, an only child, was born a healthy and well-developed infant, and, although nursed on the bottle, has always been vigorous and to all appearances free of any hereditary disease. There is no history of malignant neoplasms affecting immediate ancestors. When she was six weeks old the mother noticed a very slight elevation on the right upper lid. It was firm to the touch, rolled about under the finger, and was not surrounded by a red or swollen area, on the skin surface, at least. It remained in *statu quo* until the child was 3 months old. Then the mother believed it to be growing and consulted a well-known ophthalmologist, who, although he would not give a positive opinion as to its exact nature, advised that the patient be kept under observation for about a month longer, before advising its immediate removal. As the family were about to remove to Chicago, nothing was done. The condition of affairs was about this, when I first saw her, two months ago: The right upper lid is slightly swollen throughout and of a darker pink than the corresponding left lid. There is a rounded prominence occupying the junction of the middle and inner third of the lid. On palpation, an irregularly oval, apparently movable body, of rather firm consistence and of the size of a white bean is felt—not unlike the ordinary chalazion. The dermal vessels are slightly more numerous and larger than are those of the opposite side. On everting the lid the body seems to project somewhat on the conjunctival aspect of the lid, and corresponding to the projection is a round mass covered with red and thickened mucosa. The vascular supply is decidedly greater than in the ordinary non-suppurating chalazion. The mass appears to involve the tarsus. There is apparently no pain in the eye and no increased conjunctival secretion.

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* Presented to the Chicago Ophthalmological Society, January, 1898.

The tumor was completely removed, under chloroform narcosis, from the conjunctiva surface, using a fenestrated forceps. There was free hemorrhage and the tumor appeared to be imperfectly encapsulated. It involved the tarsus, part of which was removed at the time of operation. Macroscopically, it resembled a piece of muscular tissue. Dr. Evans, of the Columbus Medical Laboratory, examined the growth and gives the following report:

"Fresh specimen, 6x4x2 mm. No epithelial covering. Microscope shows it to be composed of round and spindle cells—more of former—with considerable intercellular substance, some pre-existing fibrous tissue, an artery with unusually thick walls. The growth is a sarcoma."

The sections exhibited showed no naked vessels communicating directly with the cells. So far, three months after removal, there has been no recurrence of the growth.

LENS-HOLDER FOR FINISHING TESTS.

BY F. B. EATON, M. D.

SAN JOSE, CAL.

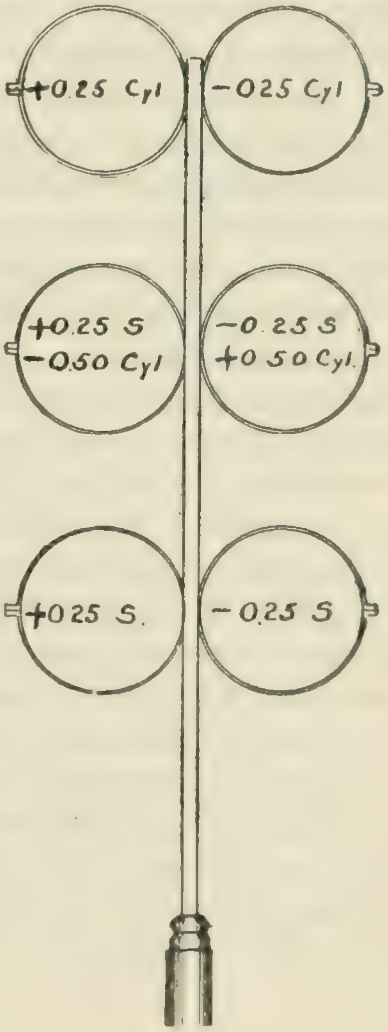
Illustrated.

The accompanying cut explains the device, the object of which is to enable the examiner to quickly place the lenses before the eye, and to rapidly compare their effect.

The lenses are easily turned in their frames, and the axes of the cylindrical ones should be so placed that the refractive effect of each is contrary to the one opposite it. The two sphero-cylinders have the same crossed-cylinder values, but in opposite meridians.

The lenses are one and one-quarter inches in diameter and the whole affair is very light.

It has been very useful in the writer's hands, and was made at his suggestion by the California Optical Co. of San Francisco, from whom it can be purchased.



A METHOD OF TESTING THE OBLIQUE MUSCLES FOR THE DISTANCE.—A PRELIMINARY STATEMENT.

WM. E. BAXTER, M. D.,

BOSTON.

Since the study of the action and balance of the oblique muscles was undertaken some years ago by Dr. G. C. Savage, the writer has made careful investigation into the condition of these muscles in his refraction work, with the view of determining to his own satisfaction the frequency of these imbalances, and the importance of correcting these conditions by exercise. No one who has given much attention to these investigations can overlook the important part played by these muscles in the determination of the axes in oblique astigmatism; and the working rule deduced by Dr. Steele, after careful study of the action of the oblique muscles, is based upon physiologic facts that cannot be controverted.

The only method of testing the balance of these muscles has been at the near point by means of the card with a line drawn on it; and after reduplicating this line by the use of the single or double prism, any dipping of the line seen by the eye under the test is discovered. This test, while the only one known, has been regarded by the writer as unsatisfactory, insomuch as it has been made at the working point instead of at a distance, as is the custom when testing the recti muscles; that this has been considered a defect is shown by the fact that while the testing for the imbalance has had to be made at the working point for the lack of means of a distance test, the exercise of these muscles is always carried on at a distance. After carefully considering this defect in the method of testing the oblique muscles, the writer has been able to perfect a simple method of testing at a distance, and so enable the examiner to obtain the balance at the far point, as is done in testing the balance of the recti muscles. The method consists of placing before each eye, by means of a trial frame, a Maddox rod, or better, a rod and prism, as in the Prince or Bonschur and Holmes phorometer, with the axes of the rods vertical. On looking at a point of light situated six meters distant, a band of light is seen by each eye extending horizontally. Should there be any hypophoria, this should be corrected by rotating the prism in one phorometer until the two lines are on the same level, when they will merge and appear as one line. Now the lines may be separated by revolving the prism in the second phorometer, and it will be at once seen whether the lines are equidistant or if they touch at one end, and are separated at the other; or, in place of moving the second prism, a double prism may be placed, first before one eye, and then before the other, and any dipping of the middle line will become apparent, and if present, the line can be brought up to the horizontal by means of cylinders revolved before the eyes in the same manner as when the test is made with the card and line. It is the writer's belief that, by the use of this distant test of the oblique muscles, facts of additional value will be found regarding them.

553 Boylston Street.

AT THE MEETING of the Acad. of Med. (Paris), held on January 11th, M. Darier stated that in purulent ophthalmia, and indeed in all conditions affecting the secretory functions of the conjunctiva, nitrate of silver is recognized, so to speak, as a specific, but that its action is somewhat too caustic. He, therefore, proposed instead to use some salts or combinations of silver of an organic nature, for these, owing to their penetrating and highly antiseptic qualities, gave just as good results as the nitrate, without giving rise to the pain and the violent reactions which accompany this latter salt. Protargal, a combination of silver with protein, seems superior to every other salt of silver. It has great penetrating power, and is strongly bactericidal; it is not irritating, and solutions of it will keep for a long time without undergoing any change. It is not precipitated from its solution by either albumins or alkalies. It can be used in combination with cocaine, a method which seems to open up a new field in the therapeutics of conjunctival affections.—*London Lancet, January 29, 1898.*

DR. EDWARD L. HOLMES.

We are fortunate in being able to present in this issue an excellent likeness of our venerable and distinguished confrere, Dr. Edward L. Holmes, whose seventieth birthday occurred January 28, 1898, and was recently celebrated by the Chicago Ophthalmological Society in a complimentary dinner.

Most of our readers, doubtless, know Dr. Holmes, or are more or less familiar with his worth and work, but a few facts in regard to his life may not seem inappropriate at this time. He was born in Dedham, Mass., in 1828, and graduated from Harvard College in 1849, teaching in a Latin school at Roxbury, Mass., for two years. He obtained his medical degree at Harvard Medical School in 1854, and served thirteen months as interne in the Massachusetts General Hospital, at Boston. He went abroad in 1855, studying under Sichel and Des Marres in Paris, and Jaeger in Vienna, for a year and a half.

Sichel was then an old man and Des Marres was his assistant. The ophthalmoscope had recently been invented, and Sichel termed it a toy which gave a very pretty picture, but was perfectly useless. He urged his pupils to make their diagnosis without its aid; in fact, said they must be able to do so. Des Marres, being younger, was full of enthusiasm, and invited those who wished to, to go to his home for instruction in its use. Few took advantage of the opportunity, Dr. Holmes being one, but he at first was only half convinced that Sichel was not correct.

He tells us that they taught the principles of myopia and presbyopia, but only just mentioned astigmatism. There was nothing taught of hypermetropia, and students were particularly warned against allowing a child to put on his father's or grandfather's glasses, at the peril of his sight. There was no scientific arrangement of correcting lenses then, a mere handful being used, which were fastened at the end of a handle. Dr. Holmes did not consider the apparatus important enough to warrant him in stretching his limited means to the purchase of one, and during the first six years of his practice he would make an appointment with his patient, and trot with him down to the optician's shop. After six years, however, he went abroad again, and then purchased his first set of trial lenses.

Operating was well done even in those early days, cataracts being extracted through the normal pupil. In a few years, however, the combined method was introduced, which Dr. Holmes embraced and never abandoned. He believes that the greatest strides in surgery have been made in the direction of asepsis. Operators in his early days were very careful to wash their hands, but bestowed less care upon the finger-nails. Instruments were washed in simple water and laid upon the blanket about the patient, or perhaps upon his shoulder, or a convenient chair or table, without reference to what dust might already be there. Suturing was accomplished by means of threads well waxed, and possibly strung through the lapel of the doctor's coat to be convenient when needed.

Dr. Holmes began practice in Chicago in 1856, immediately after his return from Europe, doing a general practice for nine years, though giving particular thought to his specialty. In 1858 he founded the Illinois Charitable Eye and Ear Infirmary, and in 1860 was appointed lecturer on the eye and ear in Rush Medical College. He was elected professor of ophthalmology and otology in 1869, lecturing in the summer schools and becoming a trustee of the college in 1871. In 1890 he was elected its president, his resignation having just been accepted.

In 1866, he was editor of the *Chicago Medical Journal*, with Dr. Lyman and Dr. Lackey. He has written many valuable papers on ophthalmology and otology, contributing to both eastern and western publications. He has crossed the Atlantic a number of times, having made eight trips to the other continent.

We are pleased to be able to say that while Dr. Holmes has very wisely given up his college and hospital work, he goes to his office daily, his practice being largely consultation work. C. D. W.

THE
OPHTHALMIC RECORD.

A MONTHLY REVIEW OF THE PROGRESS OF OPHTHALMOLOGY.

VOLUME VII. CHICAGO, MARCH, 1898. No. 3 NEW SERIES

EDITORIALS.

COMMON SENSE AND PARTIAL TENOTOMY.

A reading of the editorials of Allport and Würdemann in the January and February issues of this journal would lead one to believe that a black darkness envelops the heterophoric part of the field of ophthalmology. As sentinels on the wall, they seem to have heard a cry, "Watchman, what of the night?" and each has answered in his own way; and, doubtless, they both believe they have answered truly. Allport grew so confident as he wrote, that he boldly declared that no one would venture a rational criticism of the opinions he had expressed; and, in his imagination, he could see the sands crumbling beneath the feet of the constant "muscle-clipper."

In venturing a reply to Allport's editorial, the writer believes he can do so with the pen of reason dipped in the ink of pure truth. There are no other muscles of the body under a law so imperious as are the muscles concerned in effecting binocular single vision. The recti *must* control the visual axes; the obliques *must* properly relate the retinal meridians. The slightest failure to properly perform their work would produce a diplopia which is abhorred by the brain. The central organs have two means of preventing double vision; one to make weak muscles do their work at the cost of an over-supply of nerve influence sent to them; failing in this, the other is to let the eye turn in the direction of its tending and suppress its images. Between eyes that cannot be kept straight by any amount of nerve influence and eyes that have an easy adjustment, there are innumerable eyes with muscles that are out of harmony, and yet that must work in harmony. No one can deny the fact that there is such a thing as heterophoria. No one will deny that the stronger the nervous system and the better the general health, the less will be the sufferings of heterophoric patients. Too much nerve influence expended in the adjustment of heterophoric eyes means that some other part of the body must be deprived of its proper proportion of nerve force. It is not a matter of wonder that so many functional, and even organic, diseases have for their chief cause some form of heterophoria. No such disturber of the equipoise of the nervous system should be allowed to continue its baneful influence.

The cause of Allport's editorial was Stevens' paper read in Philadelphia at the meeting of the American Medical Association. This master mind presented a masterful paper, the object of which was to show why some races are peculiarly susceptible to trachoma, while others enjoy immunity. To solve this problem, both money and time were freely spent in museums in taking measurements of skulls, and especially of the orbital cavities. His conclusions were that the conformation of the skull of races peculiarly susceptible to trachoma was such as to necessitate an upward tendency of the plane of vision, a double hyperphoria; on the other hand, those races not susceptible to trachoma presented such conformation of skull as to cause a downward tendency of the visual plane, a double cataphoria. In the former condition lid-pressure helped depress the visual plane; hence, he reasoned, lid-pressure is one of the factors in trachoma. He advocated a lowering of the visual plane by partial tenotomies of both superior recti, and claimed that his experience of this method was satisfactory. These simple announcements, modestly made, do not seem to justify such expressions as "about to break out in a new spot," "hallucination," "wave aloft their bloody tenotomy scissors," "threadbare tenotomy remedy." Pathologic lid-pressure will often prolong a trachoma. No operator hesitates to do a canthoplasty to relieve this pressure, and he thereby hastens a cure. The physiologic pressure and the method of relieving it, as set forth by Stevens, is not a myth. Let us assist him by personal observation.

"High priest" and "heresy" both figure in Würdemann's editorial. In the first paragraph he states that nothing is accomplished by partial tenotomies, the muscle equilibrium being the same after numerous operations as it was before the first nicking was done. In another paragraph he attempts to frighten us with pictures of diplopia, squint, holes in the sclera, detachment of the retina, blindness and panophthalmitis, all resulting from these operations, though some of them were done by men with good professional attainments. In another paragraph he warns us against a book which he declares to be dangerous, and yet he fails to name the book or point out to us the nature of the danger it brings. The sale of a really bad book should be suppressed.

"Indiscriminate and ill-advised operations" should never have had an era, and the sooner such an era is brought to an end the better. In all departments of surgery mistakes have been made and bad operating has been done. To avoid the mistakes and improve operative procedure should be the aim of all.

Does confusion as to heterophoria really exist, or is it largely imaginary? Is it impossible, in our present state of knowledge, for us to know whether to operate or not on a given case of exophoria? And, if we are to operate, must we blindly decide on the nature of the operation to be done? No. A case of exophoria of 5° far and 8° near, with an abduction of 8° or less, calls for no operation on either externus. If the patient will persistently exercise the interni for months he may escape the necessity for any sort of an operation; but if he cannot do this, a shortening of one internus should be done. Just how much shortening should be done is a matter for the most careful judgment. It is better to fall short of a full correction than to go beyond in any operations on the eye-muscles.

Given another case of exophoria, in every respect like the one above quoted, except that the abduction is 10°, 12° or more, the indications for a partial tenotomy of one or both externi is clear. The smaller the excess of abducting power the more carefully these operations should be done, but in no case of exophoria should a complete tenotomy ever be done. Whatever exophoria remains after a partial tenotomy of both externi should be corrected by exercise of the interni, or by shortening one or both. Only one operation should be done on any one muscle. At most, only four operations should be done on any case of exophoria.

Let Würdemann help bring more good out of Egypt and we will join him in the work. G. C. S.

THE HIGHER EDUCATION OF AN OPHTHALMOLOGIST.

It goes without saying that every medical man should be as well informed as possible in every department of medicine. It is also a fact that it is simply impossible that every physician can become an expert in all of the specialties. Natural inclination, the time required for its acquirement, as well as the necessary mental qualities and abilities, would all combine to prevent this all-around higher education. It is not a question of the high grade of accomplishment each medical man might secure, but the actual amount of training each should possess in order to protect his patients as well as himself. Following this idea, in no line of medical work is a fair degree of intelligent training more necessary than in ophthalmology. The few that make it their life work and come in contact with large numbers of patients meet case after case of the most distressing and serious nature that attests the truth of this statement. These cases in the hands of men of moderate training, and with a direct acquaintance with the various forms of ocular disease, would have proved harmless and perhaps trifling. The question then is, What degree of training should each student receive, and should this requirement be made essential to graduation? The time has certainly passed when a study of the seven essentials only is necessary for the education of an accomplished physician. No medical school of any standing is without a trained corps of special lecturers, and systematic courses are given in almost, if not all, the special departments; but while these courses are given, attendance is not often compulsory, and no examination is required. In the department of ophthalmology this is especially to be regretted. It appears to me that every student of medicine should be familiar with, able to diagnose and treat all external diseases of the eye. In addition, he should understand the relation of diseased conditions of the eye to general diseases. In the only medical school that I have been associated with in a teaching capacity, this amount of special training has been made as much a necessity for graduation as a proper knowledge of anatomy. With an experience of eight years with the graduates of this institution, I am firmly convinced of the wisdom shown in the adoption of this requirement.

W. E. H.

REPORTS OF SOCIETIES.

THE OPHTHALMOLOGICAL SOCIETY OF MOSCOW

Translated and abridged from Die Ophthalmologische Klinik, January 20, 1898.

BY H. V. WÜRDEMANN, M. D.
OF MILWAUKEE, WIS.

MEETING SEPTEMBER 29, 1897.

Golovine, Experiments upon the Specific Gravity of the Aqueous Humor, had a new method for which he used a pycnometer, by which a very small amount of fluid could be examined.

1. The specific gravity of the aqueous humor in rabbits, cats and dogs is 1.0080–1.0096.
2. In men only three measures were taken, and these were cases of absolute glaucoma. In two the sp.gr. was 1.006 to 1.008, and in the third case, which was inflammatory glaucoma, it rose to 1.0139.
3. After paracentesis the sp.gr. of the new fluid is higher, 1.008 to 1.014.
4. Injuries of the cornea, instillations into the conjunctival sac in no way change the sp.gr.
5. The diffusion of salt solution under the bulbar conjunctiva does not seem to have any influence upon the sp.gr. of the anterior chamber contents.
6. One hour after death of the animal the sp.gr. of the aqueous is diminished 0.003.

Adelheim said that Golovine's results did not agree with those of other authors, especially as after death the contrary had been found; for in dead animals the sp.gr. of the aqueous is raised, which has been ascribed to evaporation of the water and the absorption of albumen from the iris and tissues.

Golovine explained that after death of an animal the albumen did not go into solution but the opposite, as no new fluid transuded in the anterior chamber the albumen was lessened and the aqueous really contained more water.

Ewetzky believes that the causes of the diverse results obtained by Golovine and other authors lay in the difference in their methods, but is inconsiderable.

Sneguirew, Maklakoff's Method of Vibratory Massage as a Curative Agent in Eye Affections, had been pleased with the method in corneal maculæ and in parenchymatous keratitis, and had noted immediate good results. In follicular, granular and phlyctenular conjunctivitis the results were also good. In three cases of hypopyon keratitis the hypopyon was speedily resorbed and the keratitis relieved. Massage was of benefit also in recurrent iritis. Traumatic cataract (!) and episcleritis were rapidly healed. In absolute glaucoma, massage was used to ascertain the influence exerted upon the intraocular pressure. This was lowered for twenty-four hours after the procedure. Vibratory massage is valuable in many eye affections and is not in the least injurious.

Adelheim said that the results achieved by Sneguirew with vibratory massage are, to say the least, a little peculiar. It cannot be well explained how massage works upon the cornea and upon the clearing of leucomata; at any rate it is probable that the corneal epithelium is destroyed, although the ivory balls used in this form of massage are perfectly smooth.

Sneguirew can give no explanation of the way in which massage works, but insists that in his experiments with rabbits no deleterious effect occurred to the corneal epithelium. Prof. Bellarminow had worked with him and could corroborate the fact that no epithelial defect could be observed by dropping in fluorescin solution after massage.

Ewetzky testified that the corneal epithelium was not injured by massage, its effect was not superficial but was deep and complicated, and perhaps recent physiologic experiments in this direction may show how it works. At any rate, in traumatic cataract and in episcleritis it is unexcelled.

Golovine had cured episcleritis in two or three applications of this massage and had seen corneal opacities quickly diminished by its use.

Krukow inquired concerning the three cases of hypopyon which had been cured by this method as there was no explanation of its action there, as could be made regarding the cornea. This question was of great interest. The diminution of hypopyon after the use of massage was not very surprising.

Sneguirew said that in all three cases the appearances of the cornea increased with the resorption of the hypopyon.

MEETING NOVEMBER 8, 1897.

Sneguirew, The Influence of Vibratory Massage upon the Diffusion from the Conjunctival Sac to the Anterior Chamber.

These experiments were made by help of the color method of Prof. Bellarminow, which is fully described in *Centralblatt für med. Wissenschaft*, Nr. 45, 1892, p. 816. The method is as follows: The three lids of the right eye of a rabbit were isolated from the eyeball by a ligature. The left eye was left intact as a control experiment. The cornea of the right eye was stroked 2–5 minutes by vibratory massage, and then a solution of fluorescin dropped in both eyes and allowed to remain 20 minutes. The sacs were washed out by boiled water, the cornea dried by hydroscopic cotton. The fluid of the anterior chamber was aspirated and placed in little glass tubes 2–3 mm. diameter and the grade of coloration of the fluid estimated by the method of Prof. B. This showed that vibratory massage had assisted transfusion; the color of the aqueous from the massaged eye was deeper than the control eye and proportional to the length of the massage. Two minutes of massage makes the color 4 to 5.33 times more than that of the other; 3 minutes, 5.33 to 8 times, and 5 minutes, 14 to 20 times. Vibratory massage lessens the intraocular pressure; diffusion of fluids is hastened, and even in dead animals it causes diffusion from the conjunctival cul-de-sac into the anterior chamber.

Adelheim said that these experiments must have been attended by lesions of the corneal epithelium, which would certainly be found by the microscope. Many solutions of continuity in the outer layer of cells would be found, and here lies the effect of vibratory massage.

Krukow did not think that the intraocular tension of the eye exercised any influence upon the diffusion process, as the tension was only subject to real filtration. If there were filtration in these cases it must be from the anterior chamber to the conjunctival sac, as the tension is greater within than without. If not due to filtration, it must be a diffusion process extraneous to the intraocular tension.

Golovine combatted the assertion that the effect of vibratory massage came through destruction of the outer layer of the cornea. For by ordinary general massage we obtain effects upon the nerves, blood-vessels and the lymphatics without abrading the skin. The principal part of the effect of vibratory massage upon the cornea was upon its richly endowed system of lymph vessels.

Krukow showed *A Case of Cysticercus in the Vitreous.* In the beginning of the disease only an ordinary iritis was recognized; after several weeks the pupil was disproportionately dilated. In the periphery of the fundus behind the iris was a round body which appeared to be a cysticercus in the retina. This body changed place so that it moved, during the examination of the patient, further from the iris. With the ophthalmoscope the movement of its head and the beginning retinal detachment was observed.

Adelheim thought that the cysticercus was first deposited in the ciliary body and afterwards migrated into the vitreous. The iritis and the location where it was first observed spoke for this. No cysticercus of the ciliary body had yet been reported.

Ewetzky thought that there was no ground for Adelheim's theory and that the diagnosis of cysticercus of the retina as first made should be upheld.

MEETING DECEMBER 7, 1897.

Kastalskaja exhibited a patient with *Injury of the Eye from a Splinter of Steel* which had gone through the cornea and iris, in the latter of which a hole could be seen and which had bored way through the zonula of Zinn and through the sclera. A small corneal scar was visible, there being a sharply defined opacity in the lens and a white spot with pigmented edges visible in the fundus, in the middle of which could be seen a black stripe, the place where the foreign body went through the sclera into the orbit. The injured eye is perfectly quiet, although the foreign body had passed completely through it. The patient is a turner and received the accident while working.

Natanson said that the force of the turning lathe would be sufficient to cause a splinter of steel to pass completely through the eye. The changes in the fundus were very much like those shown by Haab in cases where the foreign bodies had penetrated but had not gone through the sclera and had remained in the eye.

Lawrentiew was of the opinion that in this case the foreign body was caught in the sclera and had not gone entirely through. He reported a case in which a piece of gun cap, propelled by much greater force than that possible by the turning lathe, had gone into but not through the sclera.

Ewetzky did not think it possible to definitely state whether the foreign body had gone through or remained in the eye. It has been shown that chemosis and ecchymosis of the conjunctiva occurs when foreign bodies go completely through the eye into the orbit. In all cases it is safe to prognosticate that blindness will result.

Natanson said that the prognosis depended upon the chemical qualities of the foreign body. A piece of iron could remain a long time in the eye without causing irritation, while copper should always be removed.

Krukow had seen a case in his practice in which a piece of copper had been imbedded in the sclera for many months without causing any changes in the eye. He had removed the foreign body with good results and no suppuration.

Ewetzky had seen a patient who had had a piece of gun cap imbedded in his eye for many months without causing inflammation. A prominent white spot surrounded by a dark ring could be observed in the fundus. The piece of copper had become encapsuled, and for this reason it had remained so long in the eye without danger.

Natanson, *Natural Healing of Cataract* gave résumé of the literature and reported two personally observed cases; in the first of which the capsule, which yet held the nucleus, was pushed forward and visible in the anterior chamber. In the second case, the lens as well as the capsule completely disappeared. He reviewed the several theories by which spontaneous cure of cataract could be explained.

Krukow reported four cases as follows: 1. A sixty-five-year-old man had left-sided Morgagnian cataract with opaque cortex. On the right side the lens capsule contained clear fluid and a nucleus of 3 mm. diameter which projected into the anterior chamber. By a strong light the clear capsule and edge of the nucleus could be observed. The vision with glass was $\frac{8}{100}$. The capsule was opened and nucleus extracted, and vision increased to $\frac{20}{40}$. 2. In a forty-five-year-old woman who had been blinded on the right side for nine years, but who could count fingers about one foot away, had cataracta accreta. The pupil could not be dilated by atropin on account of posterior synechia, and iridectomy was done; after operation the lens was found to have disappeared and the capsule was transparent in its peripheral portion. 3. A fifty-six-year-old man, the nucleus of whose cataract was 3 to 3½ mm. in diameter and came through the pupil into the anterior chamber. The cortex was changed into a transparent fluid and he could count fingers at ten feet. After the operation his vision with a glass was from ½ to ⅔. 4. Man sixty-five years old, whose eyes, in 1881, were perfectly normal excepting for presbyopia; in 1888 had Morgagnian cataract, the nucleus of which remained in the lower part of the capsule, the upper part of the pupil being clear, the capsule being filled with a clear fluid. The spontaneous cure of the cataract in this case was not as complete as in others. The course in these cases from the beginning of the cataract to its spontaneous resorption was ten years.

Zutkewitz reported an observation of spontaneous resorption of cataract in both eyes of a woman who was one hundred and five years old. She lost her sight when seventy years old, but recovered pretty good vision at one hundred years. The natural process of resorption had in this case taken thirty years. The nuclei in both eyes were very small, being only 1½ to 2 mm. in diameter. The capsule had become loosened from the zonula in the upper part of the pupil so that a wide opening presented.

THE OPHTHALMOLOGICAL SOCIETY OF BERLIN.

Translated and abridged from Die Ophthalmologische Klinik, January 20, 1898.

BY H. V. WÜRDEMANN, M.D.
OF MILWAUKEE, WIS.

Meeting December 16, 1897.

Fehr showed *Preparations of Corneal Carcinoma.* This carcinoma had grown from the conjunctiva into the tissue of the cornea. The cancer cells had grown into the middle and superficial corneal spaces and enlarged them, and had made a natural injection of the corneal lymphatic system.

Spiro showed a *Preparation of Glaucoma Occurring in Aphakia.* This myopic eye became blind from glaucoma a short time after cataract extraction. The angle of the anterior chamber was found closed. A considerable amount of lenticular matter was found grown to the posterior surface of the cornea in the upper part. Spiro thought that the angle of the chamber became closed by these retained cortical masses and caused the glaucoma.

Ginsberg showed that in this case the lenticular matter had healed into the corneal wound, which was found 2 mm. from the angle of the chamber and about 1 mm. from the stump of the iris. He did not think that the stoppage of the anterior chamber had much to do with the lenticular mass, and, especially, closure of the anterior chamber has not been shown to be the prime cause of glaucoma. He had anatomically examined five cases of secondary glaucoma, in three of which the anterior chamber was free, in one case closed on one side, and in another case agglutinated to both sides of the corneal wound.

Hirschberg saw in this preparation a proof of the clinical observation that myopic eyes, after cataract extraction, were predisposed to glaucoma and warned, in the operation for excessive myopia, regarding the danger of retained cortical masses.

Hirschberg reviewed some of his previous publications upon *Eye Diseases of the Ancient Indians.*

SECTION ON OPHTHALMOLOGY.

COLLEGE OF PHYSICIANS OF PHILADELPHIA.

Meeting of the Ophthalmic Section of the College of Physicians of Philadelphia, January 18, 1898. Dr. Wm. F. Norris, chairman, in the chair.

Dr. G. E. de Schweinitz detailed the history and exhibited a water-color drawing of a *Case of Chancre of the Ocular Conjunctiva.* The patient was a physician, 35 years of age, who had become infected during attendance on a woman in her confinement. The manner of the vaccination was uncertain. It was not known that the patient was syphilitic. During delivery the physician's face was splashed by some of the discharge and was immediately wiped by an officious bystander with her apron. In a few days an apparently innocuous conjunctivitis developed and was treated as a simple inflammation with atropin and antiphlogistics. Six weeks after infection, when Dr. de Schweinitz first saw the case, a typical chancre had appeared on the ocular conjunctiva above the cornea, the lymphatic glands of the face and neck were swollen, and on the skin of the chest and limbs was an abundant erythematous eruption. The cornea, iris, ciliary body, and the other structures of the eye were not involved. Under mercury protiodid, the symptoms were greatly ameliorated in three weeks. The speaker alluded to the comparative rarity of primary syphilitic ulcers on the eye and lids, and quoted Bulkley's statistics, which showed that of 9,058 cases of extra genital chancre, but 4.1 per cent. were ocular. Among 94 cases of chancre of the eyelids and conjunctiva, collected by Dr. Beck, six developed on the ocular conjunctiva.

Dr. C. A. Veasey reported a *Case of Bilateral Syphilitic Ulceration of the Palpebral Conjunctiva.* A male, aged 28 years, presented swollen upper lids that were intensely red near the ciliary borders and in which the tarsi were thicker, harder, and less pliable than normal. Upon inverting them, there were found, symmetrically situated on the external halves of the palpebral conjunctivæ, two extensive, irregularly outlined phagedenic ulcers, that extended from near the centers toward the external angles. They were nearly 2 cm. long and 1 cm. broad, and had undermined edges, permitting the insertion of a probe in some places as deep as half a centimeter. The tarsi were not involved in the ulcerative process. The patient was in the secondary stage of syphilis, having a papular eruption on his body and mucous patches in his mouth. The ulcers, as well as the other symptoms, were completely healed in two months under the administration of protiodid of mercury, without distortion of the lids. The condition of the latter was unchanged six months later.

Discussion.—Dr. W. F. Norris and Dr. S. D. Risley stated that the low percentage of ocular cases was due, in some part, to the fact that many cases were never reported, and alluded to several that they had seen in the clinics of Vienna that had not been published.

Monocular Optic Neuritis.—Dr. S. D. Risley exhibited the case of W. J., aged 20, admitted to Will's Hospital, December 27, 1897, who stated that on awakening in the morning one week before, he was unable to see well with his right eye, and there had been no change since that time. He had no pain or headache, but complained of "neuralgia" when he attempted to see with the right eye alone. In the left eye vision was normal, and the ophthalmoscope showed a perfectly healthy fundus. In the right, however, were presented the typical appearances of a choked disk, and vision 6/xl. The most prominent part of nerve was seen with + 5 D. There were several flame-shaped hemorrhages, and the retina was infiltrated throughout a large area surrounding the nerve. The veins were very large, the lower temporal especially being distended to double its normal size. The pupils were equal in size and reacted normally, both separately and consensually, and muscular equilibrium was preserved. Repeated examinations of the urine gave negative results. There was no apparent rise of temperature, and no symptoms pointing to meningeal, cerebral, or orbital disease. The young man did not suffer from insomnia or loss of appetite, the tongue was clean, and the general health was apparently perfect. No cause could be assigned for the optic neuritis. There was no scotoma, but a slight contraction of the temporal and a sharp cut in the lower nasal field for form. He was placed in bed and given a calomel-and-soda purge. Blood was taken from the right temple on alternate days, and one dram of mercurial ointment was rubbed into the skin twice daily.

On January 5th, vision had risen to 6/xv, on the 10th to 6/xii, and on the 17th to 6/vii½. No new hemorrhage had occurred while under observation. The infiltration of nerve and retina were still present, but the swelling had subsided so that the most prominent part of the nerve was + 1 D. The gums had begun to show evidence of ptyalism; therefore, on the 16th, the mercurial inunctions were omitted and ascending doses of potassium iodid substituted.

Discussion.—Dr. Chas. Shaffner had in similar cases of unilateral neuritis referred the cause to a circulatory disturbance when disease of the heart was present, and in young women, to menstrual disorders. Dr. H. F. Hansell suggested that the young man had suffered a hemorrhage in the sheath or tissue of the optic nerve, caused by violent muscular exercise, such as bicycle riding. He had noted two such cases in his practice. In favor of this view he cited the unilateral character and the speedy cure in Dr. Risley's patient.

Dr. S. D. Risley exhibited two specimens of *Sarcoma of the Choroid*, mounted in formalin after the method of Priestly Smith. The patient had been brought before the Section at the meeting in April, 1897, with beginning detachment of the retina, which was diagnosticated as due to a rapidly-growing tumor near, but anterior to, the equator of the globe at the nasal side. The ball was enucleated in May, hardened for two days in a ten per cent. formalin solution, and then cut, without freezing, with a very sharp, hollow-ground razor, the section passing through the optic nerve, tumor, and pole of the cornea. The two halves of the ball were then mounted in formalin after the manner of, and in the cups devised by, Mr. Priestly Smith. They were exhibited not only as confirming the diagnosis made before enucleation, but to illustrate the great convenience and efficiency of the method of mounting and preserving sections of the eyeball. Dr. Risley urged that the excellent condition in which the specimen was preserved, illustrated a number of valuable practical points. First, that the section was made successfully without freezing, and that the parts all remained *in situ*. To accomplish this, he thought the method of making the section was important If begun in the equatorial region, there was great probability of the retina being detached by pushing it before the edge of the knife. This was much less liable to occur if the cut was made first through the optic nerve and carried forward by a gentle to-and-fro movement of the razor, as the retina and choroid were firmly attached at this point. A second point of much interest was illustrated by comparing the two halves of the specimen mounted in separate cups. In one the vitreous was opaque, and quite obscured the ciliary processes and choroid, although the tumor was well shown lying with its cut surface in contact with the surface of the glass. In the other the vitreous was transparent, so that every detail of the interior of the ball, including the tumor with its sharply defined surrounding retinal detachment, could be carefully studied. This difference Dr. Risley believed to be due to the strength of the formalin solution which was used in the mounting. In the specimen with the opaque vitreous an approximately five per cent. solution was employed. The vitreous at once became cloudy, the opacity steadily increasing for a few days until the present state was reached. Hoping to avoid this in the other half of the ball, the strength of the solution was reduced to about a half of one per cent., with the result shown in the specimen. That this strength was sufficient to preserve the tissues seems demonstrated by the fact that the section had remained in perfect condition since the preceding May, about seven months, which had included the hot summer season. He had not as yet attempted to verify this result by further experiment.

Dr. G. C. Harlan showed a man, 25 years of age, with a high degree of *keratoglobus*. The diameter of the corneæ, which were clear, was 15 mm. The irides oscillated very freely, but the lenses were not luxated. The eyes were hyperopic and with correction vision = $\frac{20}{20}$. In the left there were large and small fissures of the iris, through which the fundus could be seen.

Dr. Edward Jackson described three *Tests for Simulated Monocular Blindness*. The first was by placing in front of the seeing eye two cylinders with their axes perpendicular to each other, producing no cylindrical effect, while before the alleged blind eye a correcting lens was placed. After the patient had found that he could see with his good eye through these glasses, he was made to read the test card, and while doing so one of the cylinders was turned so as to exclude that eye from vision. In the second test, the accommodation being absent, lenses were placed before the two eyes, the one before the good eye giving most distinct vision at 20 inches, the one before the bad eye giving most distinct vision at 10 inches. The patient was then asked to read fine print, and his preference for 10 inches proved that he read with the alleged blind eye.

The third test was by holding before one eye a six-degree prism with the base to the temple. If both eyes saw, the one behind the prism turned in, and on removing the prism again turned out, the other eye remaining fixed. If one eye were blind, the prism held before the good eye caused both to move exactly alike, but when held before the blind eye it caused no movement in either.

Discussion.—Dr. Harlan said that the idea of using the prism as an objective test by watching the motion of the eye behind it, and on its removal, was a very old one, though he believed it had not before been carried out exactly in the manner referred to by Dr. Jackson.

The great difficulty with subjective prism tests is that an intelligent and experienced simulator can protect himself against them by simply winking one eye. This necessitates a multiplicity of confusion expedients, one of the most recent and most ingenious of which has been suggested by Baudry. Its object is to produce monocular or binocular diplopia at will without exciting the suspicion of the examined. The base of a prism is cemented to a rectangular block of glass of the same width, and the prism is divided by a section parallel to its base into two segments which are reunited. When the examined looks through the line of union of the prism and block with one eye closed, monocular diplopia is produced; while binocular diplopia results from looking through the line of union of the two segments, with both eyes open. The prism is so arranged in a box that either line can readily be brought before the pupil.

HOWARD F. HANSELL, *Clerk of Section.*

THE MIDLAND OPHTHALMOLOGICAL SOCIETY.

KANSAS CITY, MO., DECEMBER 13, 1897.

Dr. John M. Banister, of Fort Leavenworth, Kan., exhibited a *Case of Rupture of the Choroid.* The patient, a man 19 years of age, was struck on the right eyeball by a corn-cob the latter part of August, 1897. He first consulted Dr. Banister, January 1, 1898, on account of dilatation of the pupil of the right eye. R.V. = $\frac{18}{15}$. Accommodation was unaffected, as he could read small print with ease. Peripheral vision good. On ophthalmoscopic examination there was found a complete rupture of the choroid situated below the optic papilla, crescentic in shape, with the sclerotic shining brightly through the tear. There was a slight tendency to pigmentation. To the outer side of the external horn of this crescent, and passing upwards on the temporal side of the disc, was a second partial rupture of a tawny color, contrasting strikingly with the brilliant whiteness of the complete tear. Around its lower extremity were grouped four small patches of pigment. Both ruptures were crescentic, with their concavity towards the disc.

Dr. George E. Bellows reported a *Case of Rupture of the Choroid* in a woman, aged 42. Entered St. Margaret's Hospital, December 15, 1897, suffering from malarial fever. He was asked to examine her left eye to see if anything could be done to improve its sight.

Her family history was negative. General health good until about two months previous. About three years ago her husband struck her on the left eye with his fist. Considerable pain and swelling of the lids followed, and when she was able to open the eye she found that it was blind. No treatment was used at the time except cold applications to reduce the swelling. The eyesight has since improved until she can see objects, though indistinctly. The lids and conjunctiva are normal, cornea and lens clear, and the pupil is normal in size and reacts promptly to light. R. V. = $\frac{20}{20}$. L. V. = $\frac{1}{200}$. The ophthalmoscope shows diffuse vitreous opacities, probably old hemorrhages, one part covering the macula. There are also two ruptures in the choroid, unusual in location and direction. Lacerations of the choroid usually take a circular course, concentric with the edge of the optic disc, and are less common on the nasal side. In this case, however, the choroid is ruptured in two places, both to the nasal side of the disc and converging almost directly towards it. The retina is not injured.

Dr. W. F. Lippitt read a paper on *Toxic Amblyopia*, and reported four cases. He referred to toxic amblyopia in its more restricted sense as caused by tobacco and alcohol, and variously known as retro-bulbar neuritis, orbital optic neuritis, and central amblyopia. He thinks the previous history is the only means of differentiating between the amblyopia due to alcohol and that due to tobacco poisoning. Both acting together are the more likely to cause it. It is most often found in the steady, regular drinker, and in those who drink and smoke the cheaper grades of whisky and tobacco. The exact ingredient in tobacco that causes the amblyopia seems to be in doubt. According to Dr. Casey A. Wood, "It is the nicotine that causes the loss of vision," while Dr. George E. de Schweinitz says that some of the various poisonous ingredients other than nicotine that are found in tobacco are probably concerned in the development of so-called tobacco amblyopia. After mentioning the pathology and discussing the pathogonomic symptom of central amblyopia, the author takes up the treatment, first removing the cause, which, in the earlier stages, is all that is necessary. Medicinally, he gives potassium iodid in as large doses as can be taken. He also recommends free sweating, with hypodermic injections of pilocarpin. Nitro-glycerine and nitrite of amyl are also advised, the latter also as a prognostic test. In the later stages of the disease the administration of strychnine in doses sufficient to produce its physiological effect, and preferably given hypodermically. In the four cases reported, three gave a history of excess in both drinking and smoking, while the remaining one smoked to excess, but did not touch alcohol in any form. Under treatment as laid down by Dr. Lippitt, and strictly adhered to by the patients, marked improvement took place in three of the cases, while the fourth did not follow out the treatment, but still continued his smoking and drinking, with no improvement in his symptoms.

Discussion.—Dr. Dibble said he had made special investigation of such cases while abroad, and was inclined to believe that the trouble was caused largely from the use of whisky and tobacco, and thinks that drugs have little effect in their restoration. The remedy is to remove the cause—whisky and tobacco.

Dr. Banister held that potassium iodide was a good remedy in this disease; that this drug was not given to build up the system, but to relax the constriction of the nerve fibres.

Dr. Tyree agreed with Dr. Dibble, that to remove the cause of the disease was a more rational and effective treatment than the use of drugs.

Dr. Minney said that the had never seen a case of blindness produced by tobacco or whisky. He thought treatment important—the iodide as an eliminator, and strychnine as a tonic to the nervous system.

Dr. Bellows spoke of the pathology of the disease, and asked if possibly the same pathological condition might not exist in optic neuritis as in locomotor ataxia. This would have bearing on the treatment.

Dr. Tiffany stated that he had seen cases which were undoubtedly caused by the use of tobacco, and he had treated some with alteratives and others without, and the latter appeared to do as well as the former.

Dr. Black spoke of the tobacco heart—that in such cases, if the patient could be prevailed upon to stop the use of tobacco, that was all that was necessary, and he thought as good results could be obtained in these cases if the trouble was caused by the use of the weed.

Dr. Lippitt closed the discussion by saying that he thought the injury in these cases was caused by an exudation in the connective tissue surrounding the nerve fibres, and he believed that iodide of potassium promotes absorption of this abnormal product. He thinks so long as alcohol acts as a tonic, no harm ensues, but when taken in quantities sufficient to depress the system, it is then an abettor of tobacco in producing the trouble; that the tobacco heart, so-called, is an acute trouble, while amblyopia is chronic.

The Secretary read the report of a *case of Traumatic Enophthalmus*, the *result of gouging*, by David Webster, M.D., of New York, which will appear in full in the April number of THE OPHTHALMIC RECORD.

REVIEW.

SCHOOL HYGIENE.—By S. D. Risley, A. M., M. D., Ph. D., in A System of Diseases of the Eye. Norris and Oliver. Vol. II, pp. 353 to 419.

Since the extensive investigations of Cohn in the Breslau schools in 1865-66, innumerable reports have appeared concerning the hygienic environments of school children for the preservation of vision. The subject appears hackneyed, its leading facts so universally established as to require no further elucidation, and opinions regarding it have crystallized into convictions.

In reality this is not so. However strong the opinions and convictions at large, these are held in any community by the few, and action in the line of earnest concerted effort to accomplish a material mitigation of the evil effects of school life upon human sight is far from keeping pace with the knowledge of the conditions to be fulfilled. After thirty years of painstaking investigation in all parts of the world, during which period more than two hundred thousand pupils of all grades have been subjected to a more or less critical study of ocular conditions, one would expect that a public opinion had been aroused so irresistible, that even the corrupt municipalities of America could not oppose it. Not so. This branch of sanitary science has fared no better with an easy-going unreflecting public than any other.

The contribution of Risley fully deserves the praise it has received of being eminently scholarly. It is more than this, since it brings into relief certain facts only discoverable by the method of investigation he adopted. It did not fall within the design of his investigations, to consider the details of how Boards of Education are to be influenced to realize the importance of school hygiene, or, except briefly, how teachers are to be instructed to make a systematic examination of the state of vision, and parents notified and advised, nay, *compelled*, to secure *professional* advice for children whose eyes need it. But this is what is now most needed. Knowledge of the subject we have. How to apply it, to benefit the great, stupid stiff-necked public, is the present paramount desideratum.

Risley was assisted by a corps of six thoroughly competent associates, to each of whom was assigned a definite part in the examination of every pupil. Through the courtesy of the Philadelphia Board of Public Education, the fields of investigation were the public schools of that city, the private case books of oculists and the opticians' books. Only the more original and characteristic features of the paper will be here considered.

In order to give the statistics a true value, the utmost care was exercised to avoid inaccuracy. The examinations were made without the use of a mydriatic, but everything else was done to secure an accurate diagnosis of the existing state of refraction. The presence or absence of astigmatism subjectively, ascertained, the range of accommodation carefully taken by fine type, and the presence or absence of muscular anomalies determined and noted. As it was the ophthalmoscopic determination of the state of refraction that was mainly depended upon, all sources of error were excluded with great care, and as no mydriatic was used, every other means was employed to remove spasm of accommodation.

The main results of this investigation had been published previously by Risley, but never so concisely and lucidly. His findings as regards myopia corroborate those of other investigators, as he found during the early history of eyes presenting this refractive condition, " a more or less tonic cramp of the accommodation, injected external tunics and great hyperæmia of the optic nerve, retina and choroid," and deems it therefore obvious the process of change in the form and refraction of such eyes is not physiologic in character. He repeats his well-known observation that the globe passes from hyperopia into myopia " through the turnstile of astigmatism," and that during this transition, in no case did the eye become emmetropic.

The results of the investigation are set forth graphically in percentage curves of emmetropia, hyperopia, hyperopic astigmatism, myopia, myopic astigmatism, and mixed astigmatism. The curve-charts of most importance are those depicting severally: Disease in relation to Refraction; Vision and Pain in relation to Refraction, and Disease in relation to Age. In the first two, the curve rises rapidly from emmetropia (20 per cent.) through hyperopia (50 per cent.), hyperopic astigmatism (76 per cent.), and myopia, to its maximum in myopic astigmatism of 87 per cent. One curve is peculiar to Risley's charts, i. e., that giving the percentage of what he calls the *conus*, in relation to age and the condition of refraction, which mounts rapidly in the above order of the different refractive conditions. The conus he defines as a pathological condition, "the study and clinical history of which seems to justify the statement *that it is a limited chorioiditis of varying extent and intensity, affecting the region of the nerve entrance, and generally manifested at the temporal margin of the optic* *disk as a crescent of altered color and pigment absorption.* The massing of pigment in the ring of choroid immediately surrounding the optic nerve is a phenomenon often present to an extraordinary extent. So long as these pigment bands and crescents remained undisturbed, they were regarded as physiological. When, however, these masses of pigment, or the normal pigmentation above the disk had partially absorbed, giving rise to crescents of thinned and semi-atrophic chorioid, and the process was accompanied by general chorioidal disease, they were no longer considered as physiological" (p. 368). It was further found that when the conus is progressive, it is invariably attended with asthenopic symptoms, and with more or less general chorioiditis, and is unequivocal evidence of increasing or, at least, of threatened increase of refraction.

It is interesting to note in the chart giving the relation between asthenopia and the various states of refraction, that the curve mounts almost perpendicularly from emmetropia, 20 per cent., through hyperopia, 35 per cent., hyperopic astigmatism, 50 per cent., myopia, 60 per cent., to myopic astigmatism, 75 per cent.; the close relation of astigmatism to asthenopia and chorioidal disease being marked and unmistakable.

Risley advocates as a form of systematic entrance examination of the eyes of school children requiring no professional training, tests by the teachers of the acuity of vision by standard test letters, and of the punctum proximum of the range of accommodation, since these eliminate all pupils with considerable errors of refraction, with corneal opacities, or with serious conditions of the fundus. He concludes, that the best attention to general hygiene of the school-room, and the most approved educational methods will not suffice to arrest the spread of myopia and its attending pathological conditions, and those who have given any attention to his facts and deductions will hardly differ from this conclusion or its corollary that, "If, at the beginning of school life, these congenital anomalies of refraction could be carefully corrected by suitable glasses, we should hear much less complaint of the harmful influence of the schools upon the eyesight of our children."

Indeed, the results of the optical correction of the asthenopic eye in arresting myopia, as proved by Dr. Risley and his co-workers, is one of the most valuable and interesting discoveries of modern ophthalmology, and we believe is fully appreciated by the profession, and, to some extent, recognized by the laity in this country. It will be sufficient, then, to mention that in the paper under consideration the results of the examination of private case-books and opticians' books are graphically set forth in tables of percentage curves, by which the astonishing decrease of myopia in Philadelphia during the past twenty years is clearly demonstrated.

A large portion of the paper is devoted to a consideration of the architecture of school buildings; the lighting of their rooms; school furniture; the principles of correct and faulty sitting; blackboards, maps, books, type, etc., which cannot adequately be here reviewed. As a source for data on which medical sanitary officers can draw in our cities, towns and villages, when the erection of school buildings and their management is contemplated, the paper is most valuable.

But to return to the question: How shall we convince the public of the importance of availing itself of this knowledge? Allport of Minneapolis (*Journal American Medical Association*, March 2, 1895) proposed that "a physician of recognized ability deliver a lecture or talk on the subject to the principals of the city schools, once a year, just preceding the opening of the schools." Such a talk, or a paper read before the teachers' conventions, would also do much good missionary work; this talk, as suggested by Allport, "to include plain and comprehensive remarks on the anatomy and physiology of the eye; refraction, and how to use, but not abuse, the eyes in school and home work, and also instruct the principals how to test the eyes."

To the ophthalmologist who has cared for the eyes of young college and university undergraduates, it has probably occurred that, to a large extent, their vision is exposed to the same evils as is that of young children, and that, owing to uncorrected, or, more often, *undercorrected*, hyperopia and astigmatism, they are the victims of severe asthenopia and serious chorioidal disease, although less liable to myopia. Preparing as they are for their life work, and ofttimes self-supporting, an ocular breakdown entails mental as well as physical suffering. There is every reason, therefore, that some standard of physical condition should be established in our universities, and that those falling below it should not be allowed to take upon themselves more work than experience has shown can generally be borne.

President Jordan of Stanford University recently instructed one of his faculty committees to see to it that students should not be allowed to assume more work than their physical condition warranted, and deprecated "an education gained at the expense of a shattered nervous system." Every experienced oculist knows how frequently the eyes are involved in the wreck of a student's nervous system, and how many weary months of enforced idleness, so irksome and depressing to the young and energetic, must sometimes pass before an hour of study can be borne.

The college student is too often but a child of larger growth as regards the care of his eyes. F. B. Eaton.

CORRESPONDENCE.

To the Editors of the OPHTHALMIC RECORD:

When Dr. Jackson, in his exceedingly interesting account of a Case of Removal of the Clear Crystalline Lens for High Myopia (OPHTHALMIC RECORD, February, 1898), said that he could not recall a similar case that had been reported in this country, he overlooked the discussion appended to Dr. Harlan's paper, presented at the 1896 session of the Ophthalmic Section of the A.M.A. This is given on pages 263 and 264 of the Transactions. At that meeting Dr. Casey Wood gave a detailed history of a case that, he had operated upon, with marked success, in the early part of 1891, after the method and following the plan laid down by Fukala. As I had charge of this patient during part of the time she was under observation, I remember the case very well. Both lenses were removed by repeated needlings, and the visual results were excellent. If I recollect aright, Fukala's first article on this subject, in Graefe's *Archiv*, was translated by Dr. Wood and published, toward the end of 1890, in the *American Journal of Ophthalmology*.

Yours truly,

T. A. WOODRUFF.

VICKSBURG, MISS., Feb. 11, 1808.

Editors OPHTHALMIC RECORD:

Dear Sirs—I witnessed in this state some time since a phenomenon, the rarity of which I think will justify my reporting same, which is as follows: A black negro man, whose eyes are both gray, is married to a black negress, whose eyes are both darkish brown in color. They are the parents of five children; all of these children are black, and each child has a gray eye and a dark brown eye.

I was born in this section where negroes are very numerous, and have lived here all my life, embracing a period of forty years, and the above marks a peculiarity different from any that was ever brought to my notice.

Very truly yours,

E. FULTON CROWTHER.

NEWS ITEMS.

Personals and items of interest should be sent to
Dr. Frank Allport, 92 State St., Chicago.

Dr. William Gamble has moved his office to the Reliance Building.

Capt. E. B. Frick, assistant surgeon of Presidio, San Francisco, Cal., claims that the inhalation of the acetum aromaticum N. F., is a reliable preventative of vomiting after anæsthesia.—*Chicago Medical Recorder.*

Dr. G. C. Savage, of Nashville, Tenn., was in Chicago, February 18th, to attend the Chicago Gynæcological Society, which entertained the trustees of the "American Medical Association." Dr. Savage is one of the trustees.

In Paris the physicians have sufficient sense of the proper mutual protection, which is their right, to publish a "Black Book," containing the names of the would-be swindlers; and to refuse attendance upon those who treat medical men disgracefully.—*Chicago Medical Recorder.*

Dr. Frank C. Todd, of Minneapolis, Minn., has been appointed Clinical Professor of Ophthalmology and Otology in the Minnesota State University.

This chair has been occupied for over ten years by Dr. Frank Allport, who resigned it when he moved to Chicago.

The Executive Committee of the Optical Society of the State of New York has issued a circular to members, warning them against possible legislation adverse to their interests. "The necessity presents itself," says the circular, "to opticians to be on the alert regarding any bills, or riders to bills, which may be presented by those who have selfishly constituted themselves the guardians of the spectacle and eyeglass wearing public." The reference is to a possible anti-optician move by the medical profession of the state.

1898. WESTERN OPHTHALMOLOGICAL, OTOLOGICAL, LARYNGOLOGICAL AND RHINOLOGICAL ASSOCIATION (THIRD ANNUAL MEETING).—The third annual meeting of the Association will be held April 7 and 8, 1898, in the rooms of the Chicago Medical Society, Stewart Building, corner State and Washington streets, commencing at 9 A. M. on the 7th, and ending at 5 P. M. on the 8th.

Communications relating to the presentation of papers, or to any change in this provisional program, should be sent to

FRANK M. RUMBOLD, Secretary,
Chairman of Program Committee,
449-51 Century Bldg., St. Louis.

PROVISIONAL PROGRAM.

THURSDAY MORNING SESSION, 9:15 O'CLOCK.

Joint Session.

Address of Welcome,	E. L. Holmes, Chicago
Response,	A. Alt, St. Louis
President's Annual Address,	B. E. Fryer, Kansas City
Reception of Guests.	
Registration of Members and Payment of Dues.	
Reports of Secretary.	
Report of Treasurer.	
Report of Committee on Membership.	
Election of Members.	
Address (by invitation),	H. Knapp, New York City
Address (by invitation),	J. O. Roe, Rochester, N. Y.

THURSDAY AFTERNOON SESSION, 2:30 O'CLOCK.

(Ophthalmological Section.)-

1. "Moot Questions in Refractive Work,"	H. Gradle, Chicago
2. "Recent Researches into the Histo-Pathology of Trachoma," Discussion opened by B. E. Fryer.	A. Alt, St. Louis
3. "Miscellaneous Notes from Fifteen Years' Experience in Eye Diseases,"	Barton Pitts, St. Joseph, Mo.
4. "Four Cases of Parinaud's Conjunctiva,"	H. Gifford, Omaha
5. Paper,	A. C. Corr, Carlinville, Ill.

THURSDAY EVENING SESSION, 8 O'CLOCK.

(Ophthalmological Section.)

6. "On the Use of Suprarenal Capsule Extract in Minor Eye Surgery,"	J. A. Mullen, Houston, Tex.
7. "The Antiseptic Preparation of the Conjunctiva for Cutting Operations of the Eyeball,"	B. E. Fryer, Kansas City
8. "Dacrocystitis; Its Significance and Treatment,"	A. E. Bulson, Jr., Ft. Wayne
9. Paper,	Frank Allport, Chicago
10. "The Science of Ophthalmology,"	Dudley S. Reynolds, Louisville

FRIDAY MORNING SESSION, 9 A. M.

(Ophthalmological Section.)

12. "Use of the De Zeng's Refractometer," - T. A Woodruff, Chicago
13. "Paper on Refractometer," - J. E. Jennings, St. Louis
14. "Report of a Case of Tumor of the Cerebellum," - E. M. Heltman, Toledo
15. "Paper," - H. V. Wurdemann, Milwaukee
16. "Paper," - C. Barck, St. Louis

THURSDAY AFTERNOON SESSION, 2:30 O'CLOCK.

(Otological, Laryngological and Rhinological Section.)

1. "A Review of the Pathological Conditions Affecting the Lingual Tonsil," - E. C. Ellet, Memphis
2. "The Non-Operative Treatment of Catarrhal Diseases of the Upper Respiratory Tract," - Wm. Scheppegrell, New Orleans
3. Paper, - Edw. Pynchon, Chicago
4. Paper, - Homer Thomas, Chicago
5. Paper, - H. H. Brown, Chicago

THURSDAY EVENING SESSION, 8 O'CLOCK.

(Otological, Laryngological and Rhinological Section.)

6. "Further Report on Removal of Ossicles," Norval H. Pierce, Chicago
7. "Mastoiditis," - E. O. Sisson, Keokuk, Ia
8. "Mastoiditis of Dental Origin, Occurring in a Diabetic," - Frank Rumbold, St. Louis.
9. "Treatment of Chronic Suppuration of the Middle Ear with Gauze Packing," - Alice Ewing, Chicago
10. Paper, - M. A. Goldstein, St. Louis

FRIDAY MORNING SESSION, 9:15 O'CLOCK.

(Otological, Laryngological and Rhinological Section.)

11. Ear Article, - J. O. Stillson, Indianapolis.
12. Paper, - Max Thorner, Cincinnati.
13. "Politzer Air Bag," - W. H. Baker, Lynchburg, Va.

FRIDAY AFTERNOON SESSION, 2:30 O'CLOCK.

Joint Session.

Report of Committee on Membership.
Election of Members.
Installation of Officers.
Appointment of Committees.

PRESENTATION OF CASES, ETC.

Presentation of Cases.	Microscopical and Pathological Specimens.
Cassius D. Westcott, Chicago.	Homer M. Thomas, Chicago.
Norval H. Pierce, Chicago.	Cassius D. Westcott, Chicago.
Casey A. Wood, Chicago.	A. Alt, St. Louis.
J. E. Colburn.	

Presentation of New Instruments.

H. M. Thomas,	Chicago.
Norval H. Pierce,	Chicago.
C. Barck,	St. Louis.

Adjournment.

It is earnestly requested that all members present interesting pathological and microscopical specimens, if possible, and notify the secretary of the association of such intent on their part as soon as possible, in order that proper arrangements can be made for microscopes, etc.

Any member desiring to read a paper is earnestly requested to notify the secretary *at once*, giving subject, so that same can be placed on the program.

Any member of the profession who is eligible to become a member of the American Medical Association is eligible for membership in this association, providing they have been practicing one of the specialties, incorporated in the title of the association, at least three years, and provided they secure the endorsement of a member of the association to their application.

Application should be made to the secretary,

FRANK M. RUMBOLD,
449-51 Century Building,
St. Louis.

THE Central and Western Passenger Associations have granted a rate of one fare and one-third for the round trip on the certificate plan from all points in their territory for persons attending the meeting of the Western Ophthalmological, Otological, Laryngological and Rhinological Association, to be held in Chicago, April 7th and 8th.

Every one desiring the rate must purchase a first-class ticket to place of meeting, for which he will pay the regular fare of not less than 75 cents, and upon request will receive from thet icket agent a printed certificate. Return tickets will be sold at one-third the regular fare only to those holding certificates signed by the ticket agent and countersigned by the secretary of the association, certifying that not less than one hundred persons holding standard certificates are present at the meeting.

THE Grand Pacific Hotel will give, to members attending the meeting of Western Ophthalmological, Otological, Laryngological and Rhinological Association, a rate of two dollars a day for outside rooms with bath.

DR. PRENTICE, of Chicago, claims to have discovered an infallible test of death, asserting that "when the circulation ceases and death is an absolute fact, the blood in all the blood-vessels of the retina is observed, by the use of the ophthalmoscope, to at once assume a dull, pinkish hue;

whereas, if even the feeblest circulation be continuing, the blood in the retinal arteries will continue to be brighter than that in the retinal veins." The principal objection to this prior claim of Dr. Prentice is that the alleged discovery was old and had been *accurately* described in well-known text-books years before it was first given to the world by him in the public press. Notwithstanding this fact, a number of medical journals have copied the above paragraph, doubtless putting to the blush every medical jurist and ophthalmologist in their subscribers' list.

SCHOOL FOR BLIND CHILDREN.—Board of Education will erect a building if the city will maintain a dormitory. Attorney Daniel J. MacMahon of the Board of Education gave a verbal opinion to the Committee on Buildings and Grounds yesterday that the board could not legally apply its funds to the erection and maintenance of a dormitory in connection with the school for instruction of the blind. The committee, however, agreed to erect a building which could be used in the instruction of blind children, and recommended the passage of an ordinance by the City Council appropriating funds for the erection and maintenance of the dormitory out of funds of the city not otherwise appropriated.

The matter came up on a report on the request of Mrs. A. P. Sampson that the Board of Education erect and maintain a school for blind children. The matter has been pending since 1892, and, although the board has purchased a site for the school, the project has gone no further. The board agrees now to erect a building costing $30,000 if the city will furnish and maintain the dormitory. Mrs. Sampson said that Alderman Powers, of the Finance Committee, had promised to recommend the passage of the ordinance providing for the dormitory if the board would build the school.—*Chicago Tribune, Feb. 19, 1898.*

FEBRUARY 8TH, "The Chicago Ophthalmological and Otological Society," transformed its regular meeting into a banquet, held at the "Athletic Club," in honor of the 70th birthday of its first president, Dr. E. L. Holmes. The banquet was enlivened by after-dinner speeches, eulogistic and reminiscent of Dr. Holmes, songs by Dr. Pierce, assisted by the gentlemen present, and a highly, interesting talk by Dr. Holmes, descriptive of the early difficulties besetting the pathway of the earnest ophthalmological worker. Dr. W. Franklin Coleman, president of the society, ably officiated as toastmaster upon the occasion, and every one present felt that in honoring Dr. Holmes, they had honored themselves.

THE WELFARE OF THE BLIND.—A tea and concert for blind workers and blind pensioners was given last evening by the Association for the General Welfare of the Blind, 258 Tottenham Court road. The members of the committee present were Admiral Sir Edward Sotheby, K. C. B. (chairman), and Lady Sotheby, Mrs. Andrew Clark, Miss Chambers, Miss Maude, Major-General Trevor, R. A., the Rev. H. W. P. Richards, Mr. A. E. Griffiths, Lieutenant-Colonel Lewis (secretary), and Mr. H. E. Mullins (manager). Among the visitors were Viscountess Falkland, the Hon. Catherine Cary, Lady Bedford, Mrs. Godfrey Walter, Miss Sotheby, Miss Cecilia Sotheby, Mrs. and Miss Boyd, and Miss Gertrude Peel. The concert was provided by the visitors, and the blind people appeared thoroughly to enjoy the entertainment. The association was founded in 1856 by the late Miss Gilbert (herself blind), daughter of Bishop Gilbert, of Chichester, for the special purpose of teaching trades to the adult blind, of giving them employment in the workshops of the association and at their own homes, of providing them with material, and of insuring a market for the sale of their work through its retail shop. Seventy-nine men and women are employed in the workshops and at their homes, and fifteen who are no longer able to work are receiving small pensions. The trades taught are basket and brush making, chair-caning, sash-line and mat-making, and wood-chopping. No blind worker is ever discharged except for misconduct. An appeal is being made for help, both by subscriptions and the purchase of articles, the committee having been obliged to draw upon their capital owing to the cost of new buildings.—*London Times.*

EUPHTHALMIN MYDRIASIS.—At a meeting of the Medical Society of Giessen on June 29, 1897, Dr. Vossius reported that a 2 per cent. solution of euphthalmin had been successfully employed for production of mydriasis. Two or three drops of the colorless solution in the eye produces a medium degree of mydriasis within twenty to thirty minutes, and disappears entirely in two or three hours. No pain or other unpleasant effect follows the instillation, and the accommodation is unaffected. Euphthalmin is especially useful in ophthalmoscopic examinations, where the constricted pupil renders such an examination difficult in consequence of the temporary effect upon the pupils and the absence of disturbance of the accommodation.—*Railway Surgeon.*

DR. E. L. HOLMES, for thirty-eight years a member of the faculty of Rush Medical College, and for more than ten years president, formally retired from active connection with that institution Saturday, February 5th.

It was his seventieth birthday anniversary, and his retirement was due to a determination to bring his active labors in connection with the college to a close on that date. He will, however, continue to be identified with the institution as emeritus professor of the eye and ear. His actual resignation was presented several weeks ago, to take effect on February 5th. He has been accustomed to say that he considered that seventy years marked the close of a man's career of active usefulness. The doctor's resignation was accepted, and Dr. W. R. Harper was chosen in his stead. A committee consisting of President Harper, Dr. H. N. Lyman and Dr. Ephraim Ingals was appointed to draft a series of resolutions over Dr. Holmes' retirement. It was the purpose to have the presentation take place February 5th, but owing to the absence of several of the trustees it was decided to postpone the matter.—*Chicago Tribune.*

THE ANNUAL PRIZE offered by Dr. Robert V. Welz for the best article published in V. Graefe's *Archiv für Ophthalmologie* has been equally divided between Dr. T. H. Axenfeld for his work upon "The Etiology and Prognosis of Suppurative Metastatic Ophthalmitis," and Dr. E. V. Hippel upon "Siderosis and the Relations between Siderotic and Hematogenic Pigmentation," awarded at the meeting of the Ophthalmological Society at Heidelberg, August 4, 1897.

A PATIENT SUFFERING from an accident of a very shocking description was recently admitted to the Meath Hospital (Ireland). A strong man, aged twenty-two years, while in charge of a large circular saw, fell forward on it in such a way that it struck him between the eyes. On admission to the hospital his face was found cut across from ear to ear, his both eyes were destroyed, while brain matter escaped through the wound in his skull. *He lived nine days.—Lancet, January 22, 1898.*

THE

OPHTHALMIC RECORD

A MONTHLY REVIEW OF THE PROGRESS OF OPHTHALMOLOGY.

VOLUME VII. CHICAGO, APRIL, 1898. NO. 4. NEW SERIES

ORIGINAL ARTICLES.

AQUEOUS EXTRACT OF SUPRARENAL CAPSULE IN OPHTHALMIC PRACTICE.

BY JOHN J. KYLE, M. D.,

OF MARION, IND.

The physiological effect of the Extract of Suprarenal Gland, when injected into the system or applied locally to the mucous membranes, is as yet imperfectly understood. The chemical nature of the aqueous substance of the capsule is conflicting and indefinite, and I am unfortunate in not being able to secure a definite formula. The researches of Gourfein of Geneva, Shaffer and Oliver, and Swale Vincent have gone far to place the extract upon a solid therapeutic basis.

" In the adult the glands are triangular in shape, weighing from 1 to 2 drachms, having a cortical and medullary portion, the cortex forming a yellowish shell around the dark red or brown medulla."

Swale Vincent, M. D., reports a marked physiological difference between the extract made from the medulla and that from the cortex of the sheep or hog. The extract from the medullary portion when injected into mammals was invariably fatal, while that from the cortical portion had no physiological effect.

The powder and extract supplied to the trade is known as Saccharated Suprarenal Gland, 12 grains representing one fresh suprarenal gland. The extract when used in from 2 to 4 per cent. solution is a powerful astringent, and in my experience there is no remedy in the oculist's armamentarium that is capable of producing such a remarkable effect. I have experimented with the drug in a great number of cases during the past year, and have had no ill results.

Dr. W. H. Bates, of New York, read a paper before the *Section of Ophthalmology of the New York Academy of Medicine*, on April 20, 1896, and referred in a concise and interesting manner to the wonderful therapeutic effect of the extract. When used in the eye, nose or throat, no smarting or irritation is produced. In the eye there is a sense of coolness, with no mydriatic or myotic effect. The conjunctiva, regardless of congestion, turns suddenly pale, due to contraction of the coats of the vessels, and remains so from one to two hours. Nor do we, as verified by Dr. Bates, notice any congestion after the astringent effect has subsided. The conjunctiva, furthermore, manifesting no intolerance from long use of the drug. We notice, when applied to the mucous membrane of the nose and throat, the same astringent effect as that seen in the eye. For this reason it is especially indicated preliminary to operation upon the turbinates or upon the septum, first, because it has such a decided hemostatic effect; secondly, it prolongs and increases the effect of the cocaine. Furthermore, I have found in operation upon the nose, when I have used the extract preliminary to cocaine, that I have been agreeably surprised at the very small amount of cocaine necessary to secure complete anæsthesia, and the very little hemorrhage accompanying the operation.

In operations upon meibomian cysts, which as we know from experience, complete anæsthesia under cocaine is difficult to secure, on account of the great vascularity of the parts. We will find by using the extract as indicated that the operation can be done with remarkably less pain than when cocaine is used alone.

The extract is especially indicated in cases of chronic trachoma, characterized by marked vascularity and lachrymation, in pannus, lachrymal inflammation, acute conjunctivitis, panophthalmitis and iritis. Again, in operating upon the lachrymal duct, complete anæsthesia is procured by injecting a few drops of the extract preliminary to the cocaine; the result is so complete that no one should hesitate to give the drug a thorough test. One of my conferees has already called attention, in one of our late journals, to this fact, and I am unfortunate, from lapse of memory, in not being able to give due credit to the authority or find the reference.

Care must necessarily be taken in preparing the solution and keeping it thoroughly sterilized. From the nature of the extract we expect it to rapidly deteriorate. To preserve the solution in addition to frequent sterilization, I add a few drops of carbolic acid, or 2 drachms of an already prepared 2 per cent. phenic acid solution. This makes no chemical change and is one of the few germicides that can be used with the extract. Mercury bichloride cannot be used; when added to the extract, it gives a pinkish color, and upon heating turns to a dark red. Frequent sterilization will not alter its physiological effect. It is wise, however, as far as possible to prepare fresh solutions. To do this we take 20 grains of the saccharated gland and a 2 per cent. solution of phenic acid; mix, and filter through filter paper. We now have a clear solution of a brownish-red color, which must be kept corked and free from light. Two or three drops in the conjunctiva produce complete astringent effect. When applied to the mucous membranes of the nose or throat, we secure similar results.

In conclusion, I desire to enumerate the variety of cases in which I have used the extract with decidedly beneficial results, both as a hemostatic and as an adjunct to cocaine: Acute Conjunctivitis, Chronic Granular Conjunctivitis, Operation for the Removal of Turbinates, Exostosis of the Septum, Polypoids of the Nose, Pterygiums, Meibomian Cyst, operations upon the lachrymal duct, removal of necrosed ossicles and curettment of the attic.

A CASE OF SYNCHISIS WITH PECULIAR FEATURES.

BY JAMES B. TAYLOR, M. D.,
OF BLOOMINGTON, ILL.

The following case of *synchisis scintillans* has features of distinct interest:

Patient, John S.; American, 69 years of age. Since early manhood a cabinet maker and carpenter foreman. Very robust general health through life, and always good habits. For a year or so retired from his work and living at home. In 1892 he lost left eye by sudden attack of plastic iritis. Wednesday, June 1, 1897, worked during forenoon, feeling in perfect health. Had previous week patched his own roof, sight being good. Read daily paper morning of 1st with ease and without glasses. After midday, pain, as described by him "in top of right eye," this increasing steadily in severity and putting him to bed. By evening could see nothing. Pain unabated till Friday. Occasional uses of hot water till this date (3d), and no treatment in any form from 3d to 8th.

Was led into my office June 8th, having only faint perception of light. Cornea hazy, preventing deep inspection of ball and making diagnosis difficult. Treatment: Atropia, leeches, abundant hot water douches, and laxative. No urinary lesion discoverable. General functions of body, to all tests, normal.

Under treatment, gradual clearing of eye occurred. On 11th came to office with rhapsodic description of what he had seen. The experience was interesting in itself. One might go from it, if he were so disposed, into a good deal of philosophy and psychology. " Doctor," said he, " I have seen the most beautiful things that mortal eye ever looked upon. First, I saw gold and silver spangles all over my coat. Going into the street and reaching the sunlight, the air was filled with a display of falling gold and silver which was overwhelming. It was a great, beautiful storm of bright metals, whirling and tossing and filling all space. It fell upon the sidewalk in such sheets and masses that I lifted my feet sometimes 18 inches to avoid ploughing through it. It was too handsome to step upon or to disturb. No scene that man ever got up, no fireworks display ever approached it. Think of the whole universe being adorned with it! It is pretty nearly worth losing an eye to see it." And I dare say the old man's eloquence was justified. He repeatedly came back to the subject and always with the same enthusiasm, as he saw the panorama from day to day.

Examination on 11th showed cornea and pupil so cleared as to allow seeing into posterior chamber. In the posterior chamber, ophthalmoscope showed the cause of the display. The vitreous was filled with a veritable snowstorm of cholesterin and tyrosin crystals. These eddied and swayed and sparkled in the reflected and diffracted light in a way to make certainly a magical scene when projected into outer space. Throughout the whole time of vision and of improvement the romance continued more or less.

A very curious feature was that at the time of his coming, having had no atropia, and afterward under atropia, the pupil was an extremely oblong perpendicular cat's pupil; but that gradually (by 21st) pupil became and remained oval in the opposite direction.

Vision June 8th, dim perception of light; on June 20th, $\frac{2}{200}$, increasing till on July 3d it reached $\frac{12}{200}$. Preceding this date he had come to tell time of day by his watch and read his name written fairly large upon an envelope. Could also find his way upon streets with ease.

Throughout the case while under observation, there was a tendency to the accumulation of a cloudy mass behind the center of the lens. Free leeching had always marked effect upon this, and in twenty-four hours distinct improvement seemed regularly to follow its use. Tension of eye (from time to time moderately plus) would yield to such treatment.

It seemed clear that the means used had definite controlling influence upon the disease, to clear the media and check fresh precipitation of crystals. In how far there was an inevitable liquefaction of the vitreous remains a question. Perhaps it was not so inevitable could treatment have been followed up. It is interesting that so long as the prescribed handling was faithfully responded to on his part, he was steadily better.

After about a month's treatment the old gentleman concluded that he could judge of the situation for himself and save money by absenting himself from treatment. In four or five weeks of such obstinacy he rapidly lost what he had gained, and retrograded once more, and finally (for, in a morbid state of mind, he declined further expense or treatment) to base perception of light.

The case is not reported as one of pleasing and successful cure, but for its pronounced and singular features, and for the interesting hint it gives us as the effect of leeching (allowing something for the concomitant items of treatment) in holding up the integrity of the vitreous and preventing further production of the insoluble crystals. Under more favorable conditions these seemed in good per cent. to settle and be held down—at least, to be prevented from such agitation and such consequent disturbance of vision. The progress of vision during sustained treatment was certainly encouraging to this degree, and the lapse and immediate retrogression upon his assuming the reins for himself has an equal lesson as to what the eye needed in its fight.

Since a recognized percentage of synchisis cases in elderly people show and carry cholesterin crystals for a good long time without reaching serious results, it seems reasonable to conclude that such results may be held in abeyance or warded off by well-directed treatment, and my case emphasizes leeching as a means.

A CASE OF HYPOPYON KERATO-IRITIS OCCURRING IN A PATIENT DURING AN ATTACK OF TYPHOID FEVER.*

BY CLARENCE A. VEASEY, A.M., M.D.

Adjunct Professor of Diseases of the Eye, Philadelphia Polyclinic; Demonstrator of Ophthalmology, Jefferson Medical College, etc.

PHILADELPHIA.

In a recent paper by Charles Stedman Bull of New York concerning the ocular complications of typhoid fever, the statement is made that the order of frequency with which these complications occur is as follows: Conjunctivitis of the catarrhal type, phlyctenular conjunctivitis and keratitis, loss of accommodation and dilatation of the pupil, retinal hemorrhages of various kinds, paralyses of the external ocular muscles, neuroretinitis or retro-bulbar neuritis and inflammations of the uveal tract. Among the latter, or most infrequent complications, belongs the following case:

K. S., aged 53 years, a widow, had been ill for three weeks with typhoid fever, complicated with catarrhal pneumonia and jaundice, when I was requested by her physician to make an examination of her eyes. The right eye had been inflamed for two weeks, during which time there had been constant severe pain in the eye itself and throughout the right side of the head, extending to the occiput. The dread of light had also been very marked, and these two symptoms had been partially relieved by daily hypodermatic injections of morphine and by keeping the room darkened. The patient had recovered from the pneumonia, the jaundice had almost disappeared, and the typhoid fever was abating, it being the beginning of the fourth week of the disease.

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*Read before the Philadelphia County Medical Society, February 9, 1898.

Examination of the eyes showed a marked serous iritis in the right eye with annular synechiæ, pupil 2mm. in diameter and dilating but little after repeated instillations of scopalamin and cocain. The visual acuity equaled the counting of fingers at 2 meters. There was slight hypopyon. No view of the fundus could be obtained. In the upper inner quadrant of the cornea at the corneo-scleral junction, there was an ulcer about 4mm. long and 2mm. broad. Between this and the center of the cornea there were several spots of infiltration (probably abscesses). The treatment advised consisted of hot compresses to be employed for 30 minutes every two hours, leeches to the temple, thorough cleansing with a saturated boric acid lotion every two hours, and the instillation of one drop of a solution of atropin sulphat (gr. iv–℥ 1) every four hours.

One week later I was requested to see the patient again, when the pupil was found to be widely dilated, except a small synechia below. There were numerous pigment spots on the lens-capsule and a number of opaque spots on the posterior surface of the cornea. These latter were not the spots ordinarily seen in serous iritis, but much larger and much more opaque, it being impossible to distinguish whether they were deposits of lymph or thickened pus. There was marked pericorneal injection, intense pain and shrinking upon making the least pressure through the closed lids, and in the corneal substance were found several opaque spots (not yet ulcers) occupying not only the upper and inner quadrant, but also the lower and outer quadrant. The ulcer was a trifle larger than when first seen, the amount of pus in the anterior chamber remaining about the same. The administration of quinin was added to the treatment advised at the previous examination.

Four days later the ulcer was so much larger and the hypopyon so much greater that all portions of the former were cauterized with the actual cautery, and the hourly cleansing with a solution of formaldehyde (1-2000) was suggested. A note from the attending physician received nearly a week after the operation stated that there had been no pain since the application of the cautery, and that the opaque spots were disappearing from the cornea. The hypopyon had also disappeared.

In less than a week from the reception of the note the patient was brought to my office. The visual acuity of the right eye equaled 5/30; of the left, 5/6. The eye was quiet, and the ulcerative process had been checked. There remained a small synechia below. Massage with yellow oxid of mercury ointment, in which atropin had been incorporated, was now employed to clear the corneal opacity.

Two and a half weeks later there was a recurrence of the ulceration near the original place in the upper and inner quadrant, which soon subsided, however, from the use of atropin and frequent cleansings with the solution of formaldehyde.

Ten days later the eye was quiet and the ulcer healed. One month later the vision in each eye equaled 5/6, that of the left being 5/5 with a correcting glass, while that of the right could not be improved. There were no lesions of the eye-grounds.

The case, though an isolated one, is recorded, first, because of the infrequency of its occurrence, and second, because it serves to remind us that in all cases of disease when the vital forces are markedly impaired, or when there is a possibility of an embolic process taking place, the condition of the eyes should be carefully watched.

47 North Seventeenth Street.

RECURRING INTERNAL OPHTHALMOPLEGIA.*

BY HOWARD F. HANSELL, M.D.

OF PHILADELPHIA.

The above title does not strictly apply to each of the cases recorded below, but for clinical purposes is sufficiently accurate and descriptive. Formerly, the belief in the existence of a dilator muscle in the iris under the control of the sympathetic fibers proceeding from the carotid plexus through the ciliary ganglion was general. Recently, anatomists have claimed that no true muscular fibers extending from the sphincter to the periphery could be found by microscopic examination. More recently, however, the older view has been again advocated and strengthened by additional evidence, so that from a pathologic and anatomic standpoint, the presence of a real muscular dilator — not merely elastic fibrous bands — controlled by the sympathetic system through both the ganglion Gasserian and the carotid plexus, is accepted. "Internal Ophthalmoplegia" means paralysis of the sphincter of the iris and of the ciliary muscle, and does not include paralysis of the dilator iridis.

Three of the four cases detailed below were characterized by unilateral or bilateral mydriasis of variable degree, loss of direct, consensual, and reflex contraction to light, convergence, and to accommodation, and partial or complete paralysis of the ciliary muscle alternating with partial or complete restoration of the functions. In the excepted case there was but one attack which was followed by full recovery. They were analogous, also, in that careful questioning failed to reveal in any of the cases an underlying or exciting cause, or to determine the reason for recovery. Treatment seemed to have little or no effect in aborting or preventing the attacks. Again, no constitutional affection could be held responsible with the exception of a single case, that of Miss H., in which any connection with the scrofulous disease of the hip which had existed for several years was extremely doubtful. None of the patients was the subject of syphilis, either hereditary or acquired, as far as could be learned, or of any of the diseases that are enumerated as causative of paralysis of the cerebral nerves. The paralyses of the iris and accommodation were contemporaneous. The advance and recession of both palsies kept equal pace, so that when reading power had returned, the irides were normal in size and in reaction. The right and left eyes, however, were not affected constantly in equal degree. Frequently, one recovered much sooner than the other, or one suffered total paralysis and the other partial. In none of the cases was the paralysis a precursor or part of the symptom complex of any disease of the brain or of the central nervous system. In all cases the patients had not reached middle life, and two were under 20 years of age. In three, the iris and ciliary muscle paralysis was an isolated symptom, and remained throughout its course free from the complication of other motor-oculi palsy, or involvement of the patheticus or abducens, or of conjugate movement. In the fourth case, there was temporary paresis of all the muscles supplied by the motor-oculi on one side.

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*Read before the Section on Ophthalmology of the College of Physicians of Philadelphia, February 16, 1898.

CASE I. H.B., aged 13, consulted me September 1, 1886, complaining of inability to read for the past week. An uncertain history of malaria, six months, and of diphtheritic sore throat, three months earlier, was obtained, but other than this, he was entirely healthy. Right pupil widely dilated and unresponsive to any test; left pupil not dilated and responsive; both ciliary muscles completely paralyzed; no diplopia or headache, and no other complaint than the loss of reading power. Refraction hyperopic. Under the internal use of strychnine sulph. grain $\frac{1}{48}$, tincture of chloride of iron with quinine, and eserin locally, the symptoms continued about the same, being slightly modified as to the size of the pupils, for eighteen months, when the accommodation returned, and the pupils became responsive but remained partly dilated. The improvement continued for eighteen months. In September, 1889, he again complained of indistinctness of vision when reading with the left eye. Near point for right 4½ inches, for left 8 inches. In two months, no change. During the years between 1889 and 1895 he told me that his symptoms remained about as before, alternately better and worse, that he resorted to eserin and stronger glasses for reading, and was enabled to continue at school and, later, at his occupation of clerk. In 1895, the near point for each eye had receded to 12 inches, both pupils dilated and responsive to all tests. The left, however, was much larger than the right under a modified illumination. In 1897, the ciliary paralysis had become more complete, so that he was obliged to wear bifocal glasses containing his hyperopic correction for far, and correction for acquired presbyopia for near. The family history included that of a sister whom I never saw, but who was said to have had, early in her life, the same affection of the eyes.

Case 2. Mrs. G., aged 35, consulted me January 15, 1895, at the request of Dr. John L. Yard. She gave a history of sick headache for many years, which lately had become more frequent and more intense. With a very slight hyperopic correction, vision equaled 20/15, and gave a near point of 6 inches. R. hyperphoria of 3° was found; a prism of this amount, divided between the two eyes, was ordered and worn for fifteen months with almost entire relief from the headache. In December, 1896, the right pupil had become dilated and immovable, and remained in this condition, according to her statement, for one week. The accommodation was not affected. No mydriatic had been instilled. By January 4, 1897, the accommodation in this eye became entirely paralyzed. There was no limitation of the field, and no other disturbances whatever. This condition slowly changed for the better until April, when the paralysis of both iris and accommodation had almost entirely recovered. The paralysis was limited to the right side, the left not having been affected at any time. She was in good health, had no other symptoms of disease, and seemed in her usual normal condition. There was no specific or rheumatic history, disease of the heart, or other assignable cause. She has had no recurrence.* A possible explanation of the R. hyperphoria can be found in associated paresis of the superior oblique of the right eye, although, after recovery from the irido-plegia, the hyperphoria persisted, demanding constant use of the prism correction.

Case 3. Miss H., aged 18, noticed July, 1897, that for the past few days the vision of the left eye was blurred for near work. Upon her first visit to me, August 3d, it was found that the right pupil was dilated ad-maximum and unresponsive; the left partly dilated and slightly responsive. With the right eye, the nearest point she could read 1½m. type was 15 inches; with the left, 50m. type at 8 inches. Thus, the right ciliary muscle was completely paralyzed, while the left had almost recovered. In September, the pupils were still partly dilated, but responded actively to light and slowly to accommodation. Accommodation entirely restored. She could read 37m. type at 5½ inches with each eye. One week later the pupils were again dilated, the right to 8mm., left to 7mm.; near point, R. 9 inches for 37m.; L. 7 inches for 37m. The following week she recovered completely, and was well for another week. October 18th the vision became dull again; both pupils dilated, left ad-maximum, right moderately; accommodation equals .37m. at 12 inches. The last note was made November 20th, and is as follows: "She has been able to read since her last visit with the exception of four intervals—one lasting four days; one, two days; one, one day; one, one-half day; pupils react well, and are slightly dilated; vision, 20/15; reads 25m. type easily at 8 inches." The external muscles are in equilibrium, vision is perfect, and there is no error of refraction. Miss H. is rather a delicate girl, having suffered for years with a supposed scrofulous abscess. She was able, however, to attend to her occupation, that of clerk, and to pursue her ordinary pleasures. At the time of the paralysis of the iris and accommodation, no change had been noticed in her health, so that no connection could be traced between the abscess and the eye condition. There was no assignable cause. Treatment consisted of eserin locally and strychnia internally.

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*This patient has reported a second attack continuing four months, from which she has completely recovered.

Case 4. Mr. T., aged 35, complained in May, 1897, of blurred vision for near objects, which had developed rapidly during one day. No pain, no diplopia, no general paralysis or other disturbances of his usual health; low hyperopic astigmatism in each eye, the correction of which gave full acuity of vision; both pupils dilated, left 5mm., right 3mm., in moderately strong light; both reacted sluggishly to light and convergence; no limitation of the field. He had chronic specific urethritis, but gave no history of syphilis. The examination of urine showed specific gravity of 1025, acid, trace of albumin and sugar (¼ of 1 per cent.), pus corpuscles and urates, uric acid, and oxalates greatly increased. Near point for 1½m., the smallest type he could read was 10'' for each eye. July 24th, he reports no improvement. Pupils more widely dilated and immovable; near point for 75m. type was 17''. In August, a very moderate paresis of the internal rectus of R. developed, which gradually subsided. In October, he consulted Dr. Knapp, who wrote me: "Paretic symptoms of both oculo-motor nerves, for which I can find no cause." In November, he consulted Dr. Wharton Sinkler, who referred the cause to a nuclear disease. In December, accommodation had partly returned in both eyes, R. 50m. type at 14'', L. 25m. type at 13''; both pupils unresponsive to light, but responsive to convergence (Argyll-Robertson). In January, 1898, pupils and accommodation were again paralyzed, as they had been in May, 1897. He was treated with mercury carried to salivation; increased doses of potassium iodid until 300 grains daily were exhibited; with strychnia, with rest from work, with change of climate; and his mode of living was carefully regulated so that he avoided all excesses and weakening influences. Notwithstanding the care and medication, eight months after his first attack, no improvement was manifest. Alterations in the degree of paralysis and the partial recoveries were unattended with any known changes in his living or with increase of medication.

In order to fully grasp the significance of irido-cycloplegia, either as an isolated paralysis or as a prodromal symptom of serious disease of the central nervous system, an understanding of the anatomo-physiologic facts underlying the normal action of the muscles is essential. The pupil reflex, according to Henschen, is thus accomplished: The centripetal fibers in the optic nerve, *i.e.*, those going to the motor pupil center, semidecussate in the chiasm and pass into the tracts, lying upon their dorsomedian side. They then pass between the front part of the pedunculus and the outer corpora quadrigemina toward the median line, in part through the posterior part of the pedunculus, in part toward Luy's body, while the main part surrounds or enters the outer corpora quadrigemina, probably ending in the anterior pair, which, he considers, is the reflex center. From here the fibers go through the central gray cavity in the anterior part of the nucleus of the oculo-motor nerve. Each nucleolus composing this nucleus sends its branch to form the trunk of the third nerve, which, emerging from the inner side of the crus in front of the pons, passes along the outer wall of the cavernous sinus, enters the orbit by two branches through the sphenoidal fissure, and is distributed to the various muscles, and also sends a branch to the ciliary ganglion. This ganglion emits the short and long ciliary nerves which supply motor, sensitive and sympathetic impulses to the iris and ciliary body. Investigators agree that the optic nerves contain pupillary fibers that are different in function and in power of resistance from the seeing fibers of the optic nerves, but are contained in the nerve as a part of its structure. There seems, also, to be no doubt that they decussate at the chiasm, in part and perhaps in halves, each side running backward to the reflex center. Mendel claims that those fibers that do not decussate pass to the ganglion habenula, which, he says, is the reflex center, and from here to the nucleus. Heddæus is of the opinion that the iris branch in the third nerve is innervated by two roots, one from the sphincter and the other from the accommodation nucleolus. Hence, complete paralysis of the sphincter could arise from nuclear disease only when both nucleoli are affected.

The various schemes of Kahler and Pick, Perla, Stuelp and others, of the topography of the nuclei of the third nerve in the aqueduct of Sylvius, agree in locating that for the accommodation and that for the sphincter as the most anterior, and differ only in the relations of the nucleoli in the posterior portion of the nucleus. It can be readily understood that differences should arise between physiologists, when one considers the many difficulties that must be overcome to secure trustworthy results, not the least of which is the small space covered by the nucleus (not more than 6mm. antero-posteriorly, although some authorities estimate its length at 10mm.) and the natural obstacles to investigation of structures situated as deeply as the third ventricle. The most essential anatomic facts to the study of conjoined iris and ciliary paralysis are the juxtaposition of the two nucleoli and the intercommunicating fibers (Meynert's) between the two nuclei through the raphe and between the reflex centers.

The dilator iridis is controlled by the sympathetic system as follows: Two cilio-spinal centers are claimed, the superior situated in the medulla, and the inferior situated in the cord opposite to the last cervical and first two dorsal vertebræ, and connected with each other by communicating fibers in the cord. An impulse originating in the lower center passes out through sympathetic fibers in the anterior roots of the corresponding spinal nerves into the upper cervical ganglion, thence into the carotid plexus and to the Gasserian ganglion, both of which send roots to the ciliary ganglion, and thence into the ball. The situation and close relation of the ganglion to the iris movements and its disturbance in tabes and allied diseases, have led Marina to attach great importance to its controlling influences, and in fact to name it as the center for sphincter movements.

The vascular supply to the oculo-motor nucleus is not definitely settled. The majority of investigators claim that it is derived from one source only, namely, the basilar artery, and that its terminal filaments are the only ones that carry the blood to the nuclei, excepting when an anastomosis has been established. The other view, supported by Duret, said by Marina to be abandoned, is that the two anterior nucleoli, those for the iris and accommodation, receive blood from the internal carotid through its posterior communicating branches, and the remaining nuclei are supplied by the basilar arteries. If the latter opinion be the true one, isolated paralysis, permanent or recurring, could be intelligently explained on the ground of hyperemia or anemia of varying grade.

Situation of the Lesion.—A review of the monographs of Mauthner, Schmidt-Rimpler, Baas, and others on nuclear and other palsies of the third nerve, fails to reveal the mention of a single case of transient and recurring isolated paralysis of the iris and ciliary muscle unconnected with disease of the brain or spinal cord, as manifested by cotemporaneous or by later symptoms; yet it cannot be the extremely rare disease that this omission would indicate. Cases have not been published, or have been considered as prodromal symptoms, or as part of the symptom complex of other diseases. The degree of dilatation of the paralyzed pupils furnishes an indication of its immediate cause. A moderate widening points to paralysis of the sphincter (third nerve), a maximal to conjoined paralysis of the sphincter and irritation of the sympathetic. In the absence of definite information to the contrary, the assumption that the ciliary muscle is similarly innervated seems justified, and since, in our cases, the two palsies were always associated, it is presumably correct to attribute to each, one and the same cause, namely, a centrifugal lesion. Three possibilities may be considered; the lesion was double and located in each lenticular (ciliary) ganglion, single and nuclear, or double and nuclear. Affections of the centripetal fibers in the optic nerve, in front of the chiasm or behind in the tract, may be properly excluded from consideration in the diagnosis. Such an affection, unattended by disease of the visual fibers, as evidenced by diminution of central acuity or limitation of the field, has not been reported. On the contrary, the pupillary fibers are known to have resisted for a long time the encroachments of disease of the visual fibers lying in juxtaposition. If Marina is correct in assigning the reflex pupillary center to the ciliary ganglia, and the cells of these ganglia be diseased, the motor impulse emanating from them is altered or destroyed. This hypothesis assumes, naturally, a double lesion of unequal degree when the paralysis is binocular. The assumption is not tenable. Fascicular and cortical affections may be also dismissed from consideration. Disease involving these fibers must destroy the functions of other fibers and centers with which they are anatomically associated, and the palsy is compound. Pressure from exudation of meningitis, from tumors, osseus formations and the like, upon the trunks of the third nerves in their short course at the base or at their entrance into the orbits, cannot interrupt the centrifugal impulse to the iris and accommodation unless at the same time the other muscles supplied by the nerve are paralyzed. Therefore, a double basal lesion may also be excluded. We are narrowed, then, to the conclusion that the affection is nuclear in origin. In the present state of our knowledge, we cannot state positively that the pathologic changes have crossed the raphe and invaded the nucleoli on either side, or that the binocular character of the symptom is the result of a single lesion limited to the nucleoli on one side. In favor of the former, however, we have the identical location in the anterior part of the nucleus, the transference of the palsy from one to the other side, and the synchronous affection of both. Meynert's fibers are the means of communication between each nucleus, and destruction of these fibers connecting the iris and accommodation nucleoli without at least partial involvement of the others, is scarcely conceivable. The nature of the lesion is entirely problematic. A disturbance of the vascular supply is the most reasonable hypothesis, and especially if the anterior part of the nucleus has an arterial supply independent of the posterior.

Conclusions.—Isolated and recurring ophthalmoplegia interna must be regarded as a symptom of nuclear disease.

It is found in persons apparently healthy and free from inherited or acquired constitutional taint.

It may exist for many years without complications.

Recurrences arise from undiscovered causes, and cannot be prevented by known medication.

AMBLYOPIA (HYSTERICAL) IN CHILDREN.

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It is sometimes difficult to distinguish between an amblyopia of hysterical origin and malingering. The following cases were of interest to the writer, several of them in particular, on account of the extreme youth of the patients. In most of them we should be inclined to suspect malingering if any motive for it could be found, but hysteria certainly seems to be the cause in several. While children are not so liable to hysteria as are adults, we know that they are not exempt, and cases of hysterical amblyopia in children have been, not infrequently, reported; as, by Harlan (*Transactions American Ophthalmological Society* for 1889, Vol. V, p. 327), Moore (*Ibid.*, Vol. V. p. 80), Galezowski, and others. In hysterical amblyopia the patient does really see. The impressions are received normally upon the retina and conveyed to the centers. The blindness is psychical. The patient cannot see by conscious effort. We are sometimes inclined to look upon these as plain cases of malingering, but yet we must not arrive too hastily at such a conclusion. Our patient may be perfectly sincere and unable to see by conscious effort, and in no way trying to deceive us. Such cases offer an excellent opportunity for suggestive therapeutics. Hypnotism has been successfully employed to cure some cases, as, for example, four cases reported by Booth (*Medical Record*, 1895, p. 256); while others improve under various forms of simple treatment, as electricity, magnet, or a wooden imitation of a magnet, held close to the eye. Considerable has been written on this subject and many cases reported.

Without attempting at present to discuss the subject or review the literature upon it, I shall simply report the following cases:

CASE I. P. M., age 8 years, was brought to see me March 7, 1896, because he had been complaining for some time of difficulty in seeing the board at school Had some pain in the eyes, and some headache after reading. The general health was excellent, except that he had a very slight nasal catarrh. Vision, O. D. 6/60, O. S. 6/60. Could not read Jaeger No. 1, nor even ordinary print at all. Esophoria 1°, no hyperphoria. Ophthalmometer indicated: O. D., 1¼ diopters of astigmatism, axis 90° or 105°; O. S., 1¼ diopters of astigmatism, axis 75° or 90°.

Ophthalmoscopic examination: O. D., media clear, disc round, crescent of choroidal pigment to temporal side, fundus in good condition, low H or H A H; O. S., similar condition but less disturbance at outer edge of disc. As the examination gave no indication of any reason why he should not see well, I suspected the nature of the difficulty, and began trying various glasses before each eye, until finally vision was brought to the normal with a perfectly plane glass. When the glasses were removed the vision immediately fell again to 6/60. Through the plane glasses he could very readily read Jaeger No. 1. Form and color fields were normal. I thought, possibly, he did not like to attend school, and was thus attempting to escape that duty, but from all accounts by the family he seemed to enjoy it. He had, however, conceived the idea that he would like to wear glasses, and this, probably, was the secret of his trouble. Some simple local treatment was given him and he improved, complaining of nothing except occasionally that he could not see well.

He returned November 10, 1896, with the same complaint. Vision was 6/45, and again readily raised to normal with plane glasses. A solution of boric acid effected a cure.

Case II. L. G., age 9 years, unable to read, consulted me October 17, 1895, because of an acute catarrhal conjunctivitis of five days duration. Under the use of silver nitrate, simple lotions and hot packs, the inflammation rapidly subsided.

November 29, 1895, she informed me that she had not been able to see with the right eye for several days, and that her mother scolded her for upsetting things at the table. Upon trial she could not count fingers with the eye, nor even see a light across the room. The pupil was normal in size and responded promptly to light. Ophthalmoscopic examination: O. D., media clear, disc round, physiologic cup, slight choroidal disturbance at outer edge, low H.; O. S., similar condition. Tests with a vertical prism, + 20 D. spherical glass and colored glasses, readily proved that she could see as well with the right eye as with the left, provided she did not know she was using that eye. She was given some simple remedies and told to return again in a few days, if not well. Unfortunately she never returned.

Case III. E. L., age 13 years, was brought to see me January 9, 1896, with the history that for a year or more her eyes had been troubling her. She could not see the blackboard at school, and must hold her books too close. The eyes ached, and frequently she had fronto-temporal headaches. Had nose broken when a child. Is a mouth-breather, is restless at night, and nervous. Has considerable blepharospasm. Dr. Ingersoll, who kindly examined the nose and throat, reports a marked deviation of the septum, with a free space on one side and slight posterior adenoids. Ophthalmoscopic examination: O. D., media clear, disc round, physiologic cup, slight choroidal disturbance at the outer edge, slight granular condition in the macular region, almost emmetropic; O. S., similar condition. Vision, O. D. 2/60, O. S. 2/60. On trying various glasses before each eye, vision was gradually raised to normal with plane glasses, but as soon as these glasses were removed vision fell again. Two days later when she called, vision in the two eyes was 6/12. She was given a tonic, and told to report again in ten days, but, unfortunately, she did not come so that I judge she has no further difficulty.

The next case is of much more than common interest, and presented some unusual symptoms. Unfortunately, the progress of the case could not be watched, for, like many dispensary patients, she came but once, and was not seen again.

CASE IV. M. W., age 16 years, consulted me July 26, 1896. Three years ago she had typhoid fever, and had at that time some trouble with the eyes. She was fitted with glasses for the pain, but was afforded no relief. Last December she had influenza, and since that time the eyes have again been worse. She has great difficulty in reading, and if she does attempt to use them she has frontal headache. The right eye diverges somewhat, but not constantly. There is lateral nystagmus, more rapid and marked in the right eye, and especially marked during the ophthalmoscopic examination, or when she fixes intently upon an object. Vision, O. D. 6/60, O. S. 6/60. Ophthalmoscopic examination: media clear, disc nearly round, physiologic cup, arteries about normal in size, or possibly very slightly diminished, low H.; O. S., media clear, disc oval at 135°, fundus otherwise as in O. D. disc, possibly slightly paler. Examination with the perimeter showed the right form field much contracted, somewhat concentrically, and also the color fields. The field for blue is, however, more contracted than that for red. Of still more interest is a central color scotoma. In the left eye there is slight contraction of the form field on the temporal side, and decided contraction of all the color fields, with the limits for blue again inside of those for red. There is no color scotoma in this eye.

Although there were here many symptoms pointing to organic trouble, and there may have been such, I suspected also an hysterical element. By placing various glasses before the eyes, vision in each was gradually raised so that it equaled the normal (5/5) in O. D. and 5/7.5 in O. S. with plane glasses, but fell again as soon as the glasses were removed.

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"HODGES' MIXTURE."

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Inasmuch as Hodges' Mixture seems to be somewhat infrequently referred to in the standard text-books as well as in current ophthalmic literature, and, furthermore, as it has proved a valuable agent in selected cases, it seems advisable to briefly refer to some clinical experiences encountered in its use.

Hodges' Mixture is composed of two solutions, designated No. 1 and No. 2, respectively.

Mixture No. 1 has the following formula:

Argentis nitrat, ʒj.
Glycerinæ, ʒij.
Aquæ distill, ʒj.

No. 2 consists of

Potassi iodid, ʒj.
Glycerinæ, ʒij.
Aquæ, ʒj.

Three drops of No. 1 added to six drops of No. 2 results in a copious yellow precipitate, which upon chemical analysis is found to be iodide of silver. The chemical reaction taking place when the two solutions are mixed may be expressed by the following formula: $AG\ NO_3 + KI = AG\ I + K\ NO_3$. There are then in the mixture when ready for use iodide of silver and nitrate of potash in a nascent state; the water and the glycerine remaining unchanged.

In the clinical use of the remedy, it is freely applied to the affected conjunctival sac on a well saturated cotton mop, only enough of the two solutions being mixed to make one application, because it acts much more effectively when freshly prepared.

The application has been found to be practically non-irritating and followed by absolutely no reaction, and if preceded by a drop of a 2 per cent. cocaine,eucain B or holocain solution there is a minimum of smarting.

In ophthalmic practice there are certain forms of inflammatory action in the conjunctiva which are a source of worry and anxiety to the average oculist. Among these will be found: (1) acute trachoma; (2) purulent ophthalmia in the adult; (3) ophthalmia neonatorum; (4) papillary conjunctivitis in school children. Trachoma and purulent ophthalmia are looked upon by some as analogous pathologic manifestations. Again, trachoma and papillary conjunctivitis, clinically at least, have boundaries which run along similar lines.

Clinical experience gained in private practice and in dispensary work at the Harper Hospital Polyclinic has demonstrated the fact that in this group of conjunctival diseases Hodges' Mixture is particularly potent.

(1) *Acute Trachoma.*—This disease is one in which an early cure is particularly to be desired, because the earlier resolution is secured, the fewer permanent changes take place in the conjunctiva. Nitrate of silver, sulphate of copper, and the various surgical procedures employed to combat the disease in its fully-established form are undesirable when the disease is in its acute stage. In fact, their use is followed by so much reaction that frequently they must be abandoned until the disease passes into a more chronic stage, the interval being filled in by boric acid, zinc

sulphate, and other equally mild and inefficient remedies. Quite different, however, is the clinical history of an acute trachoma treated with Hodges' Mixture. No reaction, no pain, steady subsidence of the inflammatory action, progressive absorption of the deposits, and a cure of the disease in six or eight weeks is the usual clinical story of a case so handled.

Two clinical histories, briefly stated, will suffice to illustrate this phase of the subject.

Case 1. M. McM., a farmer, age 47, contracted trachoma and came under observation during the acute stage. In this case it was possible to trace the infection to a fellow worker suffering from chronic trachoma. The first consultation was on October 9, 1897. He received a daily thorough application of Hodges' Mixture until November 2d, at which time he was much improved; so much so, indeed, that it was found practicable to make the application once in two days for six weeks longer, at the expiration of which time the patient was dismissed cured.

Case 2. Mrs. O. C., age 37, housewife, was first seen at Harper Hospital June 26, 1897, suffering from acute trachoma. She received a daily application of Hodges' Mixture until August 19, 1897, and an every other day application for thirty days longer, when she was dismissed cured. An examination on January 27, 1898, revealed a normal conjunctiva in every particular, no relapse of the difficulty having occurred.

Chronic trachoma does not yield to Hodges' Mixture as well as to bluestone, but the former acts well after the roller forceps operation.

(2) *Purulent Ophthalmia in the Adult.*—The ophthalmologist in his work is placed in no situation of greater anxiety than that which confronts him when forced to deal with gonorrhœal ophthalmia in the adult. The intense inflammatory action and the cornea already jeopardized by it and the chemosis, makes him wary of still further irritating the parts by strong applications or surgical procedures which are followed by still greater reaction; and yet, the need of some remedy which will control the inflammatory action and diminish the profuse discharge is always felt. Hodges' Mixture has been found very efficient in this direction, as the following history will show:

Case 3. G. G., age 22, admitted to Harper Hospital February 2, 1898, with a typical gonorrhœal ophthalmia well established and very virulent. A bacteriologic examination of the conjunctival discharge, as well as that from the urethra, revealed gonococci in abundance. Thorough disinfection and frequent cleansing of the affected eye were instituted, and a Buller's shield was applied to the unaffected eye. Mild nitrate of silver applications (2 per cent.) were badly borne and seemed to increase the chemosis. After four days use of the silver application they were discontinued and Hodges' Mixture substituted. The effect on the discharge and swelling was noticeable in three days, and at the end of eighteen days he was dismissed from the hospital cured, the eye being perfectly white and the cornea unimpaired.

(3) *Ophthalmia Neonatorum.*—This disease has been found to yield quite as readily to Hodges' Mixture as does gonorrhœal conjunctivitis in the adult.

(4) *Papillary Conjunctivitis in School Children.*—This is an affection which occasionally gives trouble even after correction of error of refraction and muscular anomalies, nasal disturbances, digestive derangement, and faulty habits and hygiene. Hodges' Mixture has been found efficient both before and after the use of the roller forceps.

A brief retrospective glance over these clinical experiences makes one wonder how Hodges Mixture does its work. Perhaps the majority of clinicians in the light of modern bacteriologic pathology would say that in all probability the remedy is germicidal in its action. So it seemed to me.

In order to throw some light on the subject, Dr. E. H. Sargeant, lecturer on bacteriology in the Detroit College of Medicine conducted some experiments for me, which for the germs experimented upon proved entirely negative.

I append herewith a report of his investigation:

HODGES' MIXTURE.

	50 PER CENT.		75 PER CENT.		100PER CENT.		CONTROL.
	30 MIN.	60 MIN.	30 MIN.	60 MIN.	30 MIN.	60 MIN.	
Proteus vulgaris	growth	growth	growth	growth	growth	growth	growth
Stap. pyog. aureus	growth	growth	growth	growth	growth	growth	growth
Decomposing urine	growth	growth	growth	growth	growth	growth	growth
Germs from sputum	growth	growth	growth	growth	growth	growth	growth

Further bacteriologic experiments would be of great clinical interest

51 Fort street, West.

THE VALUE OF PERSISTENT TREATMENT IN CLEARING UP OPACITIES OF THE CORNEA, THE RESULT OF OPHTHALMIA NEONATORUM, WITH REPORT OF CASE.

BY J. W. BULLARD, M.D.
OF PAWNEE CITY, NEB.

A great deal has been done in recent years by legislative enactment to prevent the scourge of Ophthalmia Neonatorum. It is a fact well borne out by statistics that fully thirty per cent. of the blind in our public institutions are blind on account of having had this form of ophthalmia.

Since the advocacy by Credé of the prophylactic treatment of every new-born infant's eyes with a solution of silver nitrate, much has been done in the way of prevention in lying-in institutions; but a large number of cases occur every year in private practice, and in institutions where these preventive measures are not carried out, and an occasional case in the rural districts. What shall we do with the cases where the disease has already occurred, and the damage done? It is too often the case that these unfortunates, when presented to the surgeon, are not given the consideration that the case warrants, and in consequence are doomed to grope out their lives in darkness, when by proper persistent effort, much might be done for their relief. I shall attempt no discussion of the pathology of these cases, but content myself with a report of the following case:

Charlie W. was born about the middle of November, 1892, no physician being in attendance. The mother had been troubled with quite a profuse vaginal discharge previous to her confinement. In a day or two the child developed a severe conjunctivitis. The family physician was called after the disease was well developed, and prescribed cold compresses, bichlorid solution, frequent cleansing, etc.; but as the case was several miles in the country, it was impossible to give it the attention it should have had, and in consequence the corneæ became seriously involved. After a few days I was asked to see the child with the family physician. At this time both corneæ were entirely opaque, and it was feared the right would slough away. The little patient was brought to town, and under careful treatment the cornea did not slough. I went East in a few days after this, and knew nothing more of the case till my return, the middle of the following May, when I learned the mother had consulted an oculist during my absence, who had assured her that the child would never see any more than it could through corneæ of leather. The mother implored me to do something to restore her baby's vision. A careful examination showed a very faint shadow of the iris at lower and inner border of left cornea. I informed her that it was possible, by very persistent treatment, over a long period of time, to secure sufficient vision for the child to see to get around. The child had developed a nystagmus. Two years of faithful massage with the yellow oxid of mercury in vaseline one to sixty, cleared the cornea until it was possible to see that there was dense anterior capsular cataract in each eye, which occupied the full size of the moderately contracted pupil. After two more years of massage, each cornea at the inferior nasal quadrant appeared clear enough to justify an artificial pupil, which was first made in the right eye, as this was the worst, on June 9, 1897. On October 23, 1897, the same operation was performed on the left eye, both in inferior nasal quadrant. The nystagmus is markedly less, and the little patient's vision is as follows: O. D., = 8/200; O. S., 12/200. He has learned his letters, and sees No. 5 Jäger's quite readily at 16 to 20 cm. The cornea are both somewhat hazy over the site of the iridectomies yet; but there will, in all probability, be more clearing, and lenses may add to his already quite useful vision.

A CASE OF TRAUMATIC ENOPHTHALMUS, THE RESULT OF "GOUGING."*

BY DAVID WEBSTER, M.D.,
OF NEW YORK.

Mr. G. E. L., bachelor, age 34, assistant cashier of a bank, came under my care on January 15, 1897, having been referred to me by Drs. Gray and Thompson, of Fort Worth, Tex.

About three months previously, while engaged in an altercation, his opponent gouged his thumb in his right eye. The thumb entered the orbit below the eyeball, and the latter bulged out considerably, but at once returned into place. It was not very painful at the time. The patient did not cover the left eye and test the sight of the right, so he does not know whether there was any immediate loss of sight or not. About an hour after the injury, however, the eye became closed by swelling of the lids, and began to be very painful. A poultice of fresh, lean beef was applied to the eye. This "meat poultice" was changed two or three times in eight or ten hours. As the pain and the swelling of the lids were undiminished, he removed the poultice and tried bathing the eye with hot water five or ten minutes at a time, three or four times a day. He continued this treatment about a week. The swelling disappeared in about two days, and he could open the eye and see with it, but he does not know how well, as he had no means of testing the vision. The pain passed off gradually about a week after the injury. About two weeks after the injury his friends began to notice that his eye looked like a glass eye, and was sinking in the orbit. Five weeks after the

*Read before the Midland Ophthalmological Society, Kansas City, December 13, 1897.

injury his eye was still abnormal and seemed to be sinking in his head, whereupon he consulted Drs. Gray and Thompson. They found: Lids normal; slight discoloration of conjunctiva at inner margin of cornea, said to have been there several years; aqueous humor and iris in normal condition; pupil reacts; lens normal; vitreous and fundus in normal condition, except a small black spot above the optic disk. The surrounding orbital tissues seemed to be in a shrunken condition, allowing the eyeball to drop back in the orbit and occupy, apparently, a lower plane. Esophoria, ½°.

R. V. = $\frac{20}{15}$ —; $\frac{20}{15}$ + with + 0.50 D. c. axis 90°.

L. V. = $\frac{20}{10}$; slight improvement with + 0.25 D. c. axis 90°.

Accepts + 0.75 D. over both eyes at once.

Javal: 1.25 D., axis 90°, with the rule, both eyes.

November 8th he was seen a second time. He said his vision was not so good, and that his eye felt peculiar. On examination, vision was found the same, and no fundus changes were noticeable.

January 4, 1897, eye seemed to be the same, so far as position was concerned. No more sinking since the first examination. V. = $\frac{20}{50}$; slight improvement, with +0.50 D. c. axis 90°. Ophthalmoscope showed decided haziness of fundus and media, with what we take to be slight choroidal changes, especially below and to the nasal side of the disk. Field seemed to be slightly contracted, but no scotomata were located. We were led to believe, at first, that we had a fracture of the floor of the orbit, but sufficient time had elapsed before we saw him for trophic changes to have taken place. The treatment has been largely expectant. Strychnia and iodide of potassium were prescribed, but neither taken to any great extent.

Glasses, R. + 0.75 D. s. $\bigcirc$ + 0.50 D. c. axis 90°
L. + 0.75 D. s. $\bigcirc$ + 0.25 D. c. axis 90°

were prescribed for near work, but worn only a few days.

My own examination showed as follows: Sinking of the eye in the orbit as above described, the eye still looking singularly like an artificial eye.

V. = $\frac{20}{40}$ +; no improvement with glasses. Visual field, motility, pupil-reflexes, accommodation and color perception normal.

Javal: only irregular astigmatism.

A black spot on the sclera at the nasal margin of the cornea, the result of a fire-cracker explosion when the patient was 24 years old.

Cocaine, 6 per cent. solution, was used to dilate the pupil for ophthalmoscopic examination. Corneal haziness, irregular, but area of most marked disturbance over infero-nasal portion of pupil; no floating bodies in the vitreous, but the whole fundus was hazy; discal margins obscure and retina looked waterlogged; retinal veins were engorged and tortuous, and arteries normal, or slightly diminished.

January 16th, the irregular ophthalmometric image had passed off and Javal now shows + 1.25 D. with the rule.

V. = $\frac{20}{40}$ +. Orthophoria, abduction 4°, adduction 7°, sursumduction, R. 2°, L. 2°.

Later, R. V. = $\frac{20}{30}$ — with + 0.75 D. c. ax. 90°.

The patient was placed upon hypodermic injections of nitrate of strychnia, beginning with gr. $\frac{1}{50}$. The dose was increased on the 17th and 18th. On the 19th, after injecting gr. $\frac{1}{20}$, V. = $\frac{20}{20}$ —.

January 20th, I dilated the pupil with homatropine; cornea normal; disk and retina hyperæmic; region of macula juicy looking; retinal vessels large and somewhat tortuous, both veins and arteries; and central excavation of disk very white by contrast. In addition to the strychnia injections the patient was now placed upon mercurial inunction. The strychnia was gradually increased until on January 29th the dose was gr. $\frac{1}{7}$, which produced some effect upon his muscles. He was given strychnia gr. $\frac{1}{7}$ daily after this. On February 15th the vision was $\frac{20}{15}$. A few days later the patient returned to his home in the South, and the ophthalmoscopic appearances had become nearly normal. Although the vision remained $\frac{20}{15}$ the patient was conscious that it was less sharp than that of the other eye. The appearance of the eye had considerably improved, but there was still well marked enophthalmus and a faint suggestion of a glass eye.

ON THE ABUSE OF HOSPITAL CHARITY IN OPHTHALMIC WORK.

BY J. WALTER PARK, M.D.
HARRISBURG, PA.

In the January number of this year, of the *Annals of Ophthalmology*, I notice an article on "The Abuse of Medical Charity at the New York Ophthalmic Hospital." A man gained admission on the basis of paying $5.00 per week for board, by false representations as to his financial condition, the usual price being $15.00 per week. When it was discovered that he was financially worth about $125,000, the hospital sued for recovery of an additional amount, and received a verdict for $200. I have also noticed an editorial in the *Journal of the American Medical Association* of February 26, 1898, relative to the "Free Medical and Surgical Treatment of the Well-to-do in Michigan University" at Ann Arbor, Mich., in which a physician is quoted as saying that in order to prevent his cataract cases from going to Ann Arbor, he is obliged to calculate the railroad fare to and from Ann Arbor, two weeks' board there at $3.00 per week, and then perform the operation for that amount, regardless of the patient's financial standing. When the fees of ophthalmic surgeons must be made in that way, to meet competition, regardless of the financial standing of patients, it is high time the fraternity publicly express their disapproval of such degrading professional work, and the sooner we take measures similar to the action of the hospital authorities of the New York Ophthalmic Hospital, the better it will be for the profession at large.

The capital city of the State of Pennsylvania has its full quota of so-called pseudo-charity cases, on account of the opportunities afforded them through state and municipal politicians, as well as their proximity to the city of Philadelphia. One of the members of the House of Representatives consulted me professionally during the last session of the Legislature, and told me that his professional adviser in Philadelphia did not charge him for advice, which I found to be true; and the reasons given for these courtesies would not be approved of by the profession if I were to mention them. The courtesies extended to the members of the Legislature, however, is the least of our financial loss, for they indiscriminately give letters of introduction (and ask for free treatment to any one who will ask them for it) to some professor, or head of an eye hospital, or eye department of a hospital, which they know is only for charity cases. They not only try to secure them gratuitous treatment, but procure railroad passes for most of them. Last month a gentleman from this city went to Philadelphia to a prominent eye surgeon with a letter of introduction from one of our city politicians, and when he returned he came to see me and told me he had been to see three prominent eye surgeons, mentioning their names, and that it did not cost him a cent, yet he was well able to pay; but his letter of introduction, asking for gratuitous treatment, fulfilled its purposes.

One of our physicians came to me last spring, after the adjournment of our Legislature, and told me that he had recommended a case of strabismus to come to consult me regarding an operation, and that they could afford to pay me at least $15 for my services. A short time afterward I learned that a member of the Legislature had gotten a pass for the patient and given him a letter to a Philadelphia surgeon, saying it would not cost him anything there. One of the conductors of a prominent railroad company entering Philadelphia recently burned his eye quite severely when on one of his "runs," but he immediately went to a prominent eye hospital in Philadelphia, where he received gratuitous treatment. Are conductors, who receive from $75 to $125 per month, charity patients? The wife of one of the superintendents of a department of one of the railroads entering our city, recently came to consult me at our city hospital, but when I informed her she would be obliged to pay for treatment, she decided to come to my office and have it done there. Her husband's salary, I am informed, is $125 per month. A railway postal clerk, whose salary is $75 per month, also consulted me at our city hospital, and when informed he would be obliged to pay, did not return there again, but sought advice elsewhere, and paid for it. Another gentleman, who was a foreman in one of our manufacturing establishments, whose salary is $3 per day with regular employment, sent his child to our city hospital some time ago, and when I informed him he would be obliged to pay for services, he did not return, but took the child to one of the Philadelphia hospitals, where it was admitted, and remained until it was well, and it did not cost him anything. This was done a second time, when I addressed a letter to the resident physician of the institution regarding the financial standing of the party, but have never heard anything from him.

I could continue naming numerous instances of this kind, and, no doubt, my professional friends all have the same experiences; but a few of them are sufficient to bring this matter to their immediate attention. Dr. Edward Jackson, in the *Polyclinic* of February 26, 1898, statistically speaks of the amount of money that the medical profession of Philadelphia loses annually in the abuse of medical charity, which ought to attract attention to this serious condition of affairs, and suggest some measure to remedy the evil. We are all well aware of how the medical profession of New York City has lately taken action in this matter, and as many others have had similar experience to myself, we should take action, professionally, to the end that only those who are worthy of charity should receive the same.

What are some of the causes, and what are the remedies? I do not pretend to be able to name all the causes, nor yet the remedy for this growing abuse, but here are a few of the causes: There are too many eye dispensaries, eye hospitals, and eye departments of hospitals for the gratuitous treatment of such cases. *Real* charity cases, or such patients who are unable to pay *any* fee, could all receive the necessary attention with half the present number of hospital or dispensary facilities offered them. The great desire of the surgeons of these institutions to numerically increase their annual reports, however, so that by having crowded clinics and lack of room to accommodate their patients, they can ask for increased state appropriations, is one cause. Then, again, in order to accomplish their ends to secure these appropriations, they resort to promises of gratuitous treatment to any and all cases that may be recommended by any of the members of the legislatures, or municipal politicians, or their friends, the evil of which is apparent. The willful, false representations made by patients themselves and their friends in order to receive free treatment is another; many regard deception as an act of shrewdness, and then even boast to their friends and neighbors of how they "fooled the doctors." The increasing greed for the almighty dollar, too, induces many to plead poverty, and stoop to any act of meanness to accomplish their ends. We can readily see how many poor people have saved money if we look at the books of the various building associations; also, how many of them are subscribers to municipal and government bonds when an issue is made at a fair rate of interest, and the general public given an opportunity to subscribe for them. More than half of the so-called charity patients at our ophthalmic institutions, in my opinion, could afford to pay something, and a very great many of them should not appear there at all.

What are the remedies? That is a difficult question to answer, but here are a few suggestions: Do not increase your hospital and dispensary facilities so fast, and you will not have to ask for so many appropriations; and then, when such aid is asked of the state, make no promises to members of the legislatures, committeemen, or city politicians. Allow honesty and professional dignity to be your motto, and by asking no favors you will not be called upon to grant any. Be satisfied to treat poor people in your offices, and accept such fees as you are able to collect. If you maintain fixed amounts for all classes, you drive them away, and they naturally drift to the hospitals and dispensaries. When opportunities offer, tell people that you regulate your charges according to the circumstances of your patients. Many go to hospitals because they think specialists' prices are high and terms too rigid; to correct this impression is the first step to enable patients to consult you at your offices. The board of managers of hospitals and dispensaries should be asked if they will not make it obligatory upon their superintendents or clerks, who register patients as they apply, to carefully inquire into the occupation, residence, and financial condition of every one, and have printed notices, rules, and regulations hung up in every reception-room, to be easily seen and read. The penalty for such patients as can well afford to pay, but by deception receive free treatment, should be the collection by law of a proper fee, similar to the manner adopted by the New York Ophthalmic Hospital in a recent case of that kind.

In our city hospital, where the surgeons and their assistants do all the registering (at least, the ophthalmic department does), we make careful inquiry into the occupation and financial standing of all cases, and it is rarely the case now that any are treated gratuitously who can afford to pay something. It is surprising how few will deceive you if you question them in the proper way. A few words of explanation properly presented to all patients will be kindly received, and you will not injure the feelings of any one. There is a great field for reform work among all applicants for hospital charity, and now is the time to begin.

32 North Second Street.

A FURTHER CASE OF TARSITIS.

BY GAILLARD S. TENNENT, M.D.

OF ASHEVILLE, N. C.

The report of a complicated case, and the review of the scanty literature on the subject, by Dr. Gradle in the March number of THE OPHTHALMIC RECORD, revealed the fact that his was only the twenty-first case of tarsitis on record.

The report of another case may be of interest. The patient, a light-colored negro of 17 years, whose complexion and general appearance showed the presence of Indian blood, came into my office on the 30th of August, 1897. He denied having ever suffered from specific trouble, and stated that five weeks before this the left upper lid and the glands on the left side of the neck had begun swelling; two weeks later he had applied a poultice to the lid, which caused diffuse suppuration from the outer half of the cutaneous surface. The suppuration had ceased some days before, and, until he saw me, he had used no other treatment.

At that time the following conditions were noted: The left upper lid is enlarged and swollen to an estimated thickness of 6 or 8 mm. It overlaps the lower lid about 2 mm. and does not respond to the action of the levator, apparently being too heavy to be lifted by that muscle. The skin is œdematous and tense on the inner half, and is wanting on the outer half of the lid, where its place is occupied by thickened crusts of an amber color. In this region the cilia have disappeared and their line is obscured. The lid cannot be everted, but on lifting it with a small retractor, the conjunctival surface is found to be less hyperæmic than would be supposed, showing near its lower margin three small openings, through which thin pus can be pressed. The bulbar conjunctiva is slightly congested, and all the media are normal. There has been no pain and but slight lachrymation. The only other evidence of specific trouble was the swelling of the glands on the left side of the neck and of a small pre-auricular gland. Basing my diagnosis of syphilitic tarsitis on these signs, I prescribed potas. iodid, 15 grains, to be increased to 45 grains daily. The crusts showed no disposition to break down, so no local measures were used, save the application of a little ol. ricini every day, to keep them from cracking and exposing the raw surface. He returned in a week, showing slight decrease of the swelling, at which time he was seen by Dr. F. T. Meriwether, a general surgeon of this city. He was seen again two weeks later, when the swelling in lid and glands was very much less. The lid no longer overlapped its fellow, and could be raised at will 2 or 3 mm. The openings on the inner surface, though still present, no longer emitted pus.

He never returned, so I judge that the continued use of the iodide resulted in cure.

THE

OPHTHALMIC RECORD.

A MONTHLY REVIEW OF THE PROGRESS OF OPHTHALMOLOGY.

VOLUME VII. CHICAGO, APRIL, 1898. No. 4 NEW SERIES

EDITORIALS.

THE OTTO BECKER MEMORIAL.

We are sure that no American ophthalmologist, who remembers the debt that ophthalmic science owes to the late Professor Becker, will grudge a contribution to the above fund; but we heartily agree with the editor of the *American Journal of Ophthalmology*, that the words of the appeal for subscriptions entirely ignore the work accomplished by his predecessor in Heidelberg. It is hardly fair, in speaking of the deceased ophthalmologist, to say: "*In der stattlichen Heidelberger-Augenklinik die ihm ihre Entstehung, seinem organisatorischen Talente ihre vortreffliche Einrichtung und seiner hervorragenden Tätigkeit ihren Ruf und ihre Blüte verdankt*"—when, as Dr. Alt reminds us, it was really our own Dr. Herman Knapp who founded the Heidelberg eye-klinik, and made it famous long before Becker assumed charge of it. We do not charge the committee with a deliberate intention to suppress such a well-known fact, but a slight variation in the wording of the circular might have furnished some recognition of another famous worker, to whom Heidelberg may point with pride as the true founder of her ophthalmic institutions.

C. A. W.

A SURPLUS OF RESOURCES.

The beginner in the special practice of ophthalmology must often feel inclined to ask the advice of some more experienced specialist as to how many of various methods of examination he ought, in justice to himself and his patients, to employ as a regular thing. To such it may be safely said that he will do well to use all of the principal methods on all of his patients whose time is not especially valuable. He may test the refraction by retinoscopy, ophthalmometry, ophthalmoscopy, and the trial case; and if his office be large and his purse not too slender, use beside the perimeter and the phorometer, the tropometer and the klinometer. The practice will be good for himself, and may discover facts of scientific and occasionally of practical interest. To the man whose office hours are crowded, however, the matter presents itself in a somewhat different light. The question with him is how to get the best practical result with the least expenditure of time. Most busy men will not give more than so much time to a patient without, on the average, charging more. Now, granting that every asthenopic patient should have a thorough examination with the ophthalmoscope and the trial case, with some quick tests for visual fields and muscle-equilibrium; is it right, as a routine practice, to take his time and money for tests by ophthalmometry, retinoscopy, and extended phorometry, to say nothing of less practical methods?

It is, perhaps, for patients who come from so great a distance that it may be difficult or impossible to see them again; but for others, I think it is not. In the great majority of asthenopic cases, relief will be given if the refraction be carefully corrected, without paying any attention to the phorias. It seems, therefore, not unreasonable to neglect them until correction of the refraction has been tried, except in those rather rare cases where the extent of the heterophoria makes it probable that the use of glasses may be avoided by correcting the muscular anomaly. In testing the refraction, the use of retinoscopy and ophthalmometry may save some men time; but for those (the great majority, I believe) to whom they are not time-savers, is there any reason, aside from the danger of being considered behind the times, why they should be used as a routine practice? Nearly all observers agree as to the paramount importance of the trial case test. If there is any discrepancy between the results of the objective and subjective methods, we certainly must abide by the latter; for who but the patient can best judge where the visual area lies? Where lack of mental development renders the subjective test unreliable, it is apt also to interfere, to some extent, with the objective tests; though, perhaps, least of all, with ophthalmoscopy. Granting, however, that in this class of cases we have to rely largely or entirely upon the objective methods, the fact remains that, for the vast majority of our patients, retinoscopy and ophthalmometry are of secondary importance from a strictly practical point of view. From a scientific standpoint, of course, every encouragement should be given to those who, at their own expense of time or money, endeavor to elucidate problems of refraction by these methods.

H. G.

REPORTS OF SOCIETIES.

MEDICAL SOCIETY OF BUDAPEST.

Translated and Abstracted from Die Ophthalmologische Klinik, February 28, 1898.

BY H. V. WÜRDEMANN, M.D.,

OF MILWAUKEE, WIS.

MEETINGS NOVEMBER 13 AND 20, 1897.

"*Discussion upon the Operation for Myopia.*" *Goldzieher* showed the case of a woman teacher, 26 years of age, who had 14 D. myopia on both sides. With correcting lenses, vision 6/XV and 6/XX. After two discissions of the lens and two punctures, there remained a somewhat thick pupillary membrane, which, however, had lately become partly resorbed. The resultant vision was 5/XXX without glasses and with + 2.00 D. 5/XV.

V. Grosz mentioned the difficulties which Fukala of Vienna, as well as Vacher of Paris, had found in the practical application of operations for myopia. The advantage of the operation lies in the reduction of the refraction with resultant increase of vision, the re-establishment of binocular vision, and the hindrance to the further progression of the myopia. The dangers of the operation lay in infection and glaucoma. Infection is always to be feared. Glaucoma is always a menace, but may be prevented. Bleeding into and detachment of the retina are to be considered. His conclusions are: 1. Only cases of over 14 D. are to be operated upon. 2. Only one eye at a time shall be operated upon. 3. The operation should be done only in young or middle-aged persons. Recent chorio-retinitis or considerable detachment of the retina are contra-indications. If one eye has been lost by the operation, the other should not be operated upon. Under these precautionary measures, twelve myopia operations have been done at the Budapest University Eye Clinic without any failures. The diminishment of the refraction was as high as 20 D. In one case the visual acuity was raised five times, and in general the visual acuity was doubled or tripled. Five days after the discission, as a rule, the anterior chamber was opened, and in many cases this procedure must be repeated.

Ili declared, while he was no opponent to the operation, he considered that this procedure should be approached with great conservatism. The results achieved immediately after the operation do not show its actual value. Persons who have been operated upon should be watched during their entire lifetime in order to find out what changes occur in such eyes, years afterwards. Therefore one should only operate upon very high degrees, and then only on one eye.

Feuer. Cases of myopia under 15 D. should not be operated upon, and also those cases in which bleeding has occurred. Detachment of the retina has not been observed after the operation. In cases of rapidly developing cataract, as has been reported by Goldzieher, the prognosis for the resultant vision is poor. One eye only should be operated upon.

Mohr. Patients should not be forced to the operation, and only cases of high myopia should be operated upon. Besides this, the cases are to be carefully selected. The posterior capsule should not be opened.

Bela.—If the operation checks the progress of the myopia it should be done early.

Siklossy, Sr.—Removal of the lens prevents the progress of myopia in most cases. At least it hinders its course. Changes in the vascular structures are a contra-indication to the operation, which should be done only on one eye.

Siklossy, Jr.—The operation, such as Prof. Goldzieher had done in the present case, should be considered entirely satisfactory. Further discission was not at all necessary in this case. In elderly persons iridectomy may be advisable. A myopic eye that has been operated upon has a much more favorable prognosis than one which has not.

Goldzieher.—Since the introduction of the operation by Fukala, Vacher and Mooren, the extraction of the lens in myopia has become a common procedure. Bleeding into the choroid is not always a contra-indication, but the reverse, as Gelpke and Sattler had reported cases in which the operation had proved of considerable benefit against the recurrence of hemorrhage. Patients who have been operated upon for myopia are very much pleased with their increased vision in comparison with those operated upon for cataract, who, on account of the new conditions of refraction in their eyes, do not see as well as before they had the cataract. G. had operated upon seven cases, one of them both sides, and always with good results. In only one case, a forty-year old woman with cataract and very high myopia, he had a poor result, which happened on account of loss of vitreous occurring through the restlessness of the patient, and was later followed by detachment of the retina. He had also operated with good results upon three myopes who had traumatic cataract.

MEETING OF THE BELGIAN OPHTHALMOLOGICAL SOCIETY.

Translated from the Ophthalmologische Klinik, February 5, 1898.

BY H. V. WÜRDEMANN, M.D.,
OF MILWAUKEE, WIS.

(NOVEMBER 28, 1897).

Venneman. "*The Iris.*"—The iris arises through the growth of two membranes of separate embryonal sources and different histologic structure. The posterior membrane is epithelial, and arises from the ectoderm. The anterior membrane is formed from the mesoderm, and is the layer which composes the parenchyma of the iris and contains the vessels, nerves and muscles. A transparent fibrillary structure lies between the two membranes. In domesticated animals the stroma of the iris is composed of common or fibrillary connective tissue. In the human being the parenchyma of the iris is composed of a lower form of connective tissue. In the tissue of the mesoderm of the human embryo there are round cells without intercellular substance and star-shaped cells, whose processes are advanced between the round cells and anastimose with each other. These spherical cells, whether isolated or in groups, lie in the mass of protoplasm. This embryonal tissue remains in the human iris and forms the anterior layer, which is also called the granular layer. With this development of the embryo there is found an homogeneous mucoid matrix between the round cells of the embryonal connective tissue and the former round cells now become star-shaped. This fetal tissue is also found in the human being and composes the capillary layer of the iris. Fibers of connective tissue proceed later into the matrix of this mucoid tissue, arranging themselves in bundles, and finally compressing the original tissue. The fibrillary tissue in the iris of the adult shows but little of this structure, it being limited to the anterior surface of the posterior layer and the space between the sphincter pupillæ and the uvea. All connective tissues which line serous cavities originate, on outer surface, cells which compose the endothelium; thus the cells which form the anterior surface of the iris are covered over with an endothelial membrane. Fuchs thinks that the endothelium does not come into the crypts, into the pupillary zone, and into the ciliary bodies. Besides this, he is of the opinion that the fissures of the anterior surface of the iris lead in the middle of the iris around the radically directed large vessels into the lymph spaces. In order to convince himself that this lymph space was not in the iris, Vennemann made an oblique radial cut through the iris, and determined that there was a homogenic matrix between the processes of the starlike cells of the vascular layer, which, with their cut edge, is clearly contracted between the empty space separating the two layers of the iris.

Nuel. "*Stomata and Lymph Openings on the Anterior Surface of the Iris and the Lymph Spaces in the Iris.*"—Demonstrated a preparation in which there were six similar stomata visible on the iris, and also showed under the microscope a stoma of the anterior surface of the iris from an albinotic rabbit. In this preparation, the endothelium was stained with $AgNO_3$. By making serial sections, it is possible to follow out the openings and the canals, to recognize how they arise and disappear, how they communicate with each other, and finally merge into the anterior chamber. In diseased eyes, these conditions are obliterated. The hardening of the specimen must be done under the best conditions in order to prevent the iris from crumpling. The lymph spaces of the iris are developed differently, according to the individual. The anterior layer of the iris and its endothelium are carried over the depressions. The spaces are first empty, but later hold bloodvessels. The openings are located on the anterior surface in the angle and on the pupillary edge of the iris. The above-described spaces exist through the breadth of the iris and divide its tissues in two layers, of which the posterior invests the sphincter around the pupil. This muscle affects mostly the posterior layer, and through contraction opens the lymph spaces, and by relaxation the posterior lamella is laid upon the anterior. Fuchs was the first who described these spaces, but he did not think that they had anything to do with the resorption of the aqueous humor, but thought that the aqueous could pass through these into the anterior chamber. Wandering leucocytes can pass through these spaces out of the iris, and so assist in resorption of pathologic exudates. Nuel and Cornil are of the opinion that these spaces are a passageway for the aqueous humor out of the eye. In a case of ectopia of the pupil, the lymph system of the upper half of the iris was so much developed that the question was raised whether the reason for the ectopia was not in an abnormal development of the lymph openings and of the lymph spaces.

Rogman. "*Subconjunctival Lipoma.*"—Observations of this form of tumor are seldom made, and authors who have described such cases have not agreed. Sämisch and de Wecker think that the tumors are developed from the orbital tissues, while Panas, Fuchs and Wagenmann think they are dermoid growths. Other authors ascribe to them a congenital origin, and think they are developed at certain periods of life. Galezowski thinks that they are not necessarily congenital. Rogman describes five of these cases with their clinical history and pathologic anatomic findings. Two of these were clearly subconjunctival lipomata, one of which arose in a short time in a fifty-year-old woman. One case was a lipo-dermoid.

Leplat. "*Orbital Phlegmon Occurring in a Child Fifteen Days Old.*"—Inflammatory swelling of both lids, chemosis, fibrinous secretions, and fluctuation perceptible in the lower lid. The pus contained a clear culture of staphylococci. The probe was passed under, upwards and inwards behind the tear duct without feeling exposed bone. Complete healing resulted. This was a phlegmon and not an acute periostitis, the diagnosis being made by the quick development of the symptoms and the course of recovery. The presence of pus depended upon staphylococci.

Lor. "*Cataracta Siliquata Congenita Connected with the Ciliary Body.*"—Showed a nine-year-old boy, who had a white epithelial membrane behind the iris. Brown, flesh-like, spindle-shaped strands come from the membrane to the insertion of the iris. At their insertion they are sometimes wide and sometimes string-like. The eye squinted, light perception good, left cornea smaller in diameter than the right and more curved. This cataract resulted from an inflammatory intrauterine process.

Coppez. "*Observation Upon the Nucleus of the Motor Eye Nerves in a Case of Ptosis, with Associated Movements of the Lids and Lower Jaw.*"—Showed that this case was especially interesting on account of: 1. Association between the movements of the paralyzed lid and certain movements of the ball. (Looking downward and looking towards the left.) 2. Association between the movements of the paralyzed lids and certain movements of the lower jaw. (Looking downwards, sideways, and upwards.) 3. Absence of association between the movements of both upper eyelids.

Pergens. "*Monocular Diplopia in Both Eyes.*"—Monocular diplopia and polyopia are caused by changes in the cornea, iris, lens and the vitreous. They are also found in anomalies of refraction and hysteria. Pergens showed a thirty-two-year-old woman whose visual acuity was: R., 6/VIII; L., 6/XII; with hyperopia and vertical astigmatism in both sides. For five months the patient had seen double with either eye. The fundi were normal. Simulation was excluded, as the systematic examinations had always given the same results. Bromid of potash, quinin preparations and calcium-chlohydro-phosphoricum were given, under which improvement occurred. This diplopia is of cerebral origin: 1. Because correction of the refraction anomaly did not remove the double images. 2. Both images occur within the area of acute vision. 3. Because the space between the images varied at different times, while the refraction and accommodation remained the same. 4. Because there is paresthesia of the brain. The author thought that the communicating cells of the visual centers in the brain functionated in two separate masses, from each of which proceeded a part of the nerve impulse.

Gallemaerts. "*Neuroparalytic Keratitis After Extirpation of the Gasserion Ganglion.*"—This patient acquired neuroparalytic keratitis after resection of the ganglion of Gasser in spite of the eye being protected according to the rule immediately after the operation. The disease began with a superficial corneal ulceration. The edges of the cornea contained a large number of bloodvessels. At certain times the chronic disease process showed an inclination to heal.

Rutten. "*Osteosarcoma Proceeding from the Nasal Cavities and the Left Antrum of Highmore.*"—Showed a patient with beginning osteosarcoma of the nose and maxillary sinus in which, through compression of the nasal duct, there was considerable epiphora. This growth had completely filled the antrum of Highmore, and showed in the left side of the nose as a whitish-gray, ivory-hard tumor, which bled on being touched. The proper method of surgical procedure lay in resecting the upper jaw, anterior portion of the nasal cavity, and enucleation of the eye. There are three stages of growth to be differentiated in the course of solid tumors of the nose and of the maxillary sinus: 1. They are latent. 2. They cause symptoms through swelling of the walls, such as compression of the eye and of the neighboring cavities. 3. The tumor becomes visible and causes disturbances in the function of the neighboring organs.

Bullot. "*The Influence of Morphin upon Regeneration of the Corneal Epithelium.*"—Morphin hinders the process of regeneration, and can readily be observed in rabbits in whom a portion of the corneal epithelium is destroyed and then the sulphat of morphin applied to the part. Normal regeneration depends upon encroachment of the cells upon the edges of the wound and an active increase of the cells through karyokinesis. In morphinized animals the growth of the cells is hindered, which agrees with the theory of Klebs, in which the advance of the epithelial cells is supposed to depend upon ameboid movements, morphin hindering these, but is contrary to the mechanical theory of Ranvier. Morphin at first hinders the appearance of the karyokinetic figures; however, the same develop later in spite of its effect. From his experiments he concludes that subcutaneous injection produces no effect upon the cell division. Venneman thought that morphin simply affected the nutrition of the cells. To a question of Coppez, Bullot answered that morphin had no great influence upon the healing after operations such as cataract extraction.

Nuel. "*Retinal Detachment following Edema of the Macular Region.*"—Had previously described changes in the layer of Henle, under the name of macular edema, which had a tendency to proceed to macular detachment of the retina. He demonstrated preparations of an eye which was lost through spontaneous idiopathic detachment of the retina, which had begun as an edema at the macula and then had proceeded to cystoid degeneration of a portion of the retina. The preparations showed that the macular edema had been transformed into a cystoid degeneration of Henle's layer. It was composed of a number of small cysts. These had merged into a large one, and were surrounded by the edematous area. The course of the disease began with swelling of the retina, and ultimated in glaucoma and enucleation. A short distance from the papilla there was found considerable space between the outer and inner nuclear layer, which extended as far as the ora seratta. Towards the outside of the inner nuclear layer there were a few bladder-like cysts. Secondary detachment of the retina had proceeded from this.

SECTION ON OPHTHALMOLOGY.

COLLEGE OF PHYSICIANS OF PHILADELPHIA.

Meeting February 15, 1898. Dr. George C. Harlan, Chairman, in the chair.

Dr. G. Oram Ring presented the following: (1) *Glioma of the Retina.* F. K., a male, aged 2½ years. The parents noticed a peculiarity of the left eye two weeks previous to the initial examination. Right eye healthy; left, slightly prominent; episcleral veins full; sclera darker than normal; pupil immobile, 6mm. in diameter; distinct darkening of the iris and a yellowish-white pupillary reflex, proceeding from an irregular, nodular, vascular growth in the fundus covered by detached retina. The limits of the growth are extending and the tension is rapidly increasing.

Also (2) a case of *Pseudo-Glioma* in a boy of 4 years. The cornea was clear and the iris was bulged irregularly forward excepting at its periphery, T. normal. An inflammatory exudate upon the posterior capsule extended up to and beyond the lens periphery on the nasal side, and was continuous with an indistinct feathery yellow opacity in the vitreous, emitting through the pupil a dull, yellow-white reflex. The child had had, during intra-uterine life, exudative cyclitis and choroiditis, the remains of which closely resembled the appearances of glioma of the retina. The left eye was normal.

Also (3) a case of *Gummata of the Cornea and Iris* in a boy of 12. Ten weeks ago the left eye had been intensely injected for one week, and three well-defined, yellow-white nodular masses had developed in the cornea near its inner border. The iris had become discolored and firmly bound to the capsule, and was the seat of two other similar tumors. Under mercurial inunctions and atropia the eye rapidly improved.

The fourth case was that of a young man whose left eye had been blind from cataract for eight years. The cornea and anterior chamber showed the brilliant deposits of *Cholesterin Crystals*, especially numerous on Descemet's membrane and the adjoining deep layers of the cornea. The iris was attached to the opaque lens capsule in the entire circumference of the pupil; the lens was dense and white. The cholesterin was probably the remains of repeated hemorrhages from the vessels of the iris. T. — 2. The right eye had commenced to show signs of sympathetic irritation.

Discussion.—In the early stages of Case 1, Dr. W. F. Norris had been uncertain as to the nature of the affection, but later observation had removed all doubt. The progress in the growth of the tumor, in the detachment and changes in the retina, and the increased tension justified the diagnosis of glioma and warranted the speedy enucleation of the eye.

Dr. Edward Jackson showed a case of *Magnet Extraction with Peculiar Opacity in the Anterior Vitreous.* The young man was seen, and the splinter of steel extracted twenty-four hours after the accident. The fragment was 9mm. long, slightly curved, and 3mm. broad at its widest end, which lay in the lower part of the iris, with the smaller end back in the vitreous. The lens escaped injury. The bit of steel was extracted from an incision in the lower part of the cornea, and the injured portion of the iris was removed. No hemorrhage was noticed behind the iris, but an opacity consisting of fine lines almost like new-formed vessels was seen at the anterior surface of the vitreous. Its extent had steadily diminished, until at the end of five weeks the patient had vision of $\frac{8}{40}$ths in spite of the extensive corneal scar passing across the center of the pupil.

Dr. E. K. Perrine exhibited, by invitation, a case of *Traumatic Forward Dislocation of the Lens* in a man 70 years of age, who had been blind in the right eye for the past three months. Nine years earlier he had received a blow on the right brow; other than this no history of of injury or inflammation could be obtained. The lids were normal; bulbar conjunctiva injected; cornea normal; anterior chamber occupied by the dislocated lens by which the iris had been driven in contact with the cornea. The upper outward periphery of the iris was separated from its attachment. The fundus reflex could not be seen through the natural or artificial pupil. T. + 1. Light projection deficient in the lower nasal field.

Dr. Harlan read a report of the case of *kerato-globus*, which was shown at the last meeting. The patient was a healthy, well-developed man 30 years of age. His vision had never been good, but there was no history of ocular inflammation. Both cornea were much distorted and of globular form, perfectly clear and with sharply-defined margins. The sclera were entirely natural; tension normal. In the right eye the horizontal diameter of the cornea was 15mm., and the horizontal diameter of the ball at the equator was 24mm.; anterior chamber very deep; pupil 2mm. wide, reacting to light slightly and dilating partially with mydriatics; iris tremulous; media clear; fundus normal, and refraction highly hyperopic. V. = $\frac{20}{20}$ with + 6 + 1^c Ax. 180. Near-point with full correction, 7'' for Sn. 50 D. Radius of corneal curvature, 9mm. The hyperopia was accounted for by the diminished curve of the cornea and the abnormally small lens displaced backward. The left eye was slightly divergent. V. = $\frac{20}{70}$ with + 7 D.; measurements about the same as in the right eye; lens absent; fundus normal. There was a fissure in the temporal side of the iris 3mm. wide at the angle of the anterior chamber and ending in a point at the sphincter; and a number of minute radiating slits could be seen with the ophthalmoscopic mirror and a strong lens. This case cannot well be classified with the congenital hydrophthalmos or buphthalmos, because in the latter disease all the coats of the eye are distended, the disk cupped, and the refraction highly myopic, and it is generally considered to be a glaucomatic process secondary to uveal inflammation, while in this case the refraction is hyperopic and the anatomical changes are confined to the anterior segment of the ball.

It was suggested that the cornea in its period of development, perhaps somewhat retarded, had yielded to the pressure caused by an obstruction to the outflow of the aqueous humor by an incomplete separation of the iris from the cornea. This view of the pathology would also account for the limitation of the disease, as the bulging of the cornea and the stretching of the iris would tend to open up the angle of the anterior chamber.

Discussion.—Dr. Edward Jackson was surprised to find, in studying Dr. Harlan's case, the large area of the cornea that had a comparatively uniform refraction. Even when the eye was turned 30 degrees from the axis of the ophthalmometer the astigmatism still remained moderate, and the radius of curvature of the corneal surface about 9mm. The area included was larger than the whole normal cornea. The reflections of the ophthalmometer are taken from a space 3mm. in diameter, and this, if added to the diameter of a circle represented by the deviation of the visual axis of 30 degrees, would give an area of about 12mm. in diameter. If the visual axis of the normal cornea is turned even to a smaller angle from the axis of the instrument, the astigmatism usually becomes so great as to make its accurate measurement impossible.

Dr. B. A. Randall showed an unusual case of *Idiopathic Gangrene of the Skin of the Lids and Brow*, from unknown cause, recurring in a family of three children, aged 1, 3, and 5 years, of healthy parentage and good environment. The eldest two recovered; the baby succumbed. In the patient shown, the eldest, the R. upper lid was lost, and the deep ulceration on the brow, nose, and lower lid has led to keloid scarring, epicanthus, and ectropion. The destruction and consequent cicatrization of the soft tissues was greatly enhanced by the second attack, from which all the children suffered. During the first attack all were seen and treated by Dr. Harlan at Wills.

Discussion.—Dr. Harlan: The first of the three children attacked with this mysterious disease was a few-months-old infant. It had a deep, black slough of the skin of both upper lids and of the root of the nose, which, when removed, left a deeply ulcerated surface of the same extent. Both corneæ had also sloughed, and the balls were shrunken. As diphtheria was suggested as a possible cause, some of the discharge of the eye was sent to the City Bacteriological Laboratory for examination, and the presence of diphtheritic bacilli was reported, but I was never altogether satisfied with this view of the case, and the subsequent history of the other cases seems to render it improbable. The child did well, and was discharged with the ulcerated surface completely cicatrized. The other children were attacked at their seashore home while separated from this one. They were well-nourished, healthy-looking children, and the parents were robust. The house in which they lived was a new one, never having been occupied by other tenants, and with good sanitary surroundings.

Dr. Howard F. Hansell read a paper on *Recurring Ophthalmoplegia Interna*, and detailed three cases characterized by the full or partial paralysis of the iris and accommodation in both eyes, alternating with recovery, without assignable cause. A fourth case resembled the others in all particulars with the exception that thus far no recurrence had been observed. In none could the symptoms be rationally considered as prodromal to, or part of the symptom complex of, posterior sclerosis or other disease of the central nervous system. None of the patients was the subject of inherited or acquired syphilis as far as could be learned, or of any of the diseases that are enumerated as causative of paralysis of the cerebral nerves. The paralysis of the iris and accommodation were contemporaneous. The advance and recession of both palsies kept equal pace, so that when reading power had returned the irides were normal in size and reaction. The right and left eyes, however, were not affected constantly in equal degree. In three, the iris and ciliary muscle paralysis was an isolated symptom, and remained throughout its course free from the complication of other motor-oculi palsy, or involvement of the patheticus, abducens, or of conjugate movement. In the fourth, there was temporary paresis of all the muscles supplied by the motor-oculi on one side. The treatment was entirely symptomatic, and probably had no influence on the course of the disease. A consideration of the physiology of reflex iris movements and of associated ciliary muscle contraction, and of the topography of the nucleoli comprising the nucleus of the third nerve in the floor of the aqueduct of Sylvius; of the relations of the sympathetic system to both muscles, and of the possibility of the presence in the ciliary muscles of muscular tissue directly controlled by the sympathetic fibers from the ciliary ganglion, and of the vascular supply to the nucleus, led to the conclusion that the lesion in all the cases was nuclear, and dependent upon variations of the blood-supply. The following statements seem justified: Isolated and recurring ophthalmoplegia interna must be regarded as a symptom of nuclear disease; it is found in persons apparently healthy and free from inherited or acquired constitutional taint; it may exist for many years without complications; recurrences arise from undiscovered causes, and cannot be prevented by known medication.

Discussion.—Dr. Harlan recalled a case with a history resembling that described by Dr. Hansell, which had been under his care for seven years.

There had been frequent relapses of mydriasis and loss of accommodation, but the former symptom had been much more persistent, and the pupils had never at any time regained their mobility, though they varied in width from 3½mm. to 5mm., usually one larger than the other. The accommodation varied from 2 D. to 7 D., sometimes remaining nearly at the latter point for months at a time, and then suddenly diminishing, usually in one eye at a time. The patient is now about 35 years of age and has been always in fair health. Syphilis could not be absolutely excluded, but could not be established.

Dr. Harlan exhibited a *New Form of Bifocal Glass*, recently devised by Mr. J. L. Borsch. The principle of its construction is the same as that of the bifocal cataract glass made by Mr. Borsch and described by Dr. Thomson at the last meeting of the American Ophthalmological Society, namely, the difference between the refracting power of crown and flint glass.

The main lens, adapted to distance, is of crown glass, and is excavated to admit the little reading disc of flint glass curved to the desired focus. The posterior surfaces of the two lenses are ground to a uniform curve, which makes the bifocal segment practically invisible. It has the advantage over the cataract bifocals, however, in that the reading section is a complete circular lens (15mm. in diameter) instead of a decentered segment, and thus prismatic effect is avoided. The advantages over the usual form of bifocals, claimed for these glasses, are: The much larger field for distant vision, which greatly diminishes the inconvenience in walking; the more perfect centering and the absence of prismatic refraction; the achromatism resulting from the combination of crown and flint glass; the much more elegant appearance.

Howard F. Hansell,
Clerk of Section.

CHICAGO OPHTHALMOLOGICAL AND OTOLOGICAL SOCIETY.

A regular meeting was held in the Stewart Building, March 8, 1898, the President, Dr. W. F. Coleman, in the chair.

Dr. F. C. Hotz presented a patient on whom a *large epithelial flap was grafted on the eyeball for epithelioma of the conjunctiva.* The growth started in the conjunctiva of right eye near the sclero-corneal border. Two pictures were shown of how it appeared in August and December. The growth was very vascular, with engorgement of the conjunctival and subconjunctival vessels. The tumor invaded the corneal margin to a slight degree, about a millimeter or a millimeter and a half. Below the growth the corneal margin showed a narrow strip of thickened epithelium, and the adjoining conjunctiva was also thickened, just as is observed in beginning pterygium. It was dissected off from the cornea, together with the suspicious looking part of the conjunctiva below. This left quite a large defect on the eyeball; the sclera was exposed and the conjunctiva was much retracted, so that there was no possibility of covering the wound by sliding the conjunctiva over it. Grafting was resorted to, following the suggestion made by Dr. Gifford in a paper published in the December number of THE OPHTHALMIC RECORD, in which he recommended cutting an epithelial lip-flap with the razor, so as to get a thin strip of, say, one-half thickness of the mucous membrane. An epithelial flap about one centimeter and a half long, and one-half a centimeter wide was taken from the lower lip. This was fastened with fine silk sutures to the upper and lower borders of the conjunctival wound.

The case is very interesting from another point of view, and that is, with reference to the nature of the growth. It was very vascular, and in dissecting it off, bleeding was quite profuse. The microscopical examination, which was made by Professor Herzog, of the Chicago Polyclinic, showed that it was an epithelioma of the conjunctiva. Cases of carcinoma of the conjunctiva are not frequently reported. Only half a dozen cases were found in Graefe's *Archiv. für Ophthal,* one of which was reported by Graefe himself, who gave a description which is very much like the clinical picture presented in this case. It was thought to be a large and unusually obstinate phlyctenula, with marked injection of the surrounding ocular conjunctiva. He removed the tumor and Virchow made a microscopical diagnosis of epithelioma. In that case, after a year there was no recurrence.

Dr. C. D. Wescott described a case of *Primary Carcinoma of the Conjunctiva*, in which, as yet, no microscopic examination has been made of the specimen. The patient, 67 years of age, presented himself with a tumor which overhung the cornea, evidently growing from the eye just up and out from the cornea, and which was beginning to slough. It was not feasible to remove the tumor, though the cornea appeared normal, and it was impossible to tell before the eye was removed whether the tumor was partly intraocular or not. Enucleation was performed, and upon making section of the eye, no abnormality was found within the globe. The tumor had its origin from the conjunctiva just without the limbus, up and out. It is not pigmented, and has the gross appearance of carcinoma. Dr. Wescott believed it to be primary carcinoma of the conjunctiva. The growth had extended back underneath the conjunctiva somewhat, and in making the enucleation, a portion of the fornix was removed in order to get all of the tumor. The specimen is now being hardened for microscopic examination, a slide of which will be shown at some future time. The beginning of the tumor was like that of the one described by Dr. Hotz. It appeared as a little reddened pimple, and grew slowly, having reached the size it finally attained after three years. The man was a farmer, and remote from any physician, and nothing had been done for the eye until Dr. Wescott saw him, at which time the tumor had begun to slough at the apex. The tumor was so large that the lids were widely separated, and it was constantly exposed and irritated.

Dr. J. E. Colburn described a case of *Epithelioma of the Conjunctiva* which he reported two years ago, involving the conjunctiva toward the inner canthus. The growth was removed the first time, thinking it was a pterygium. The second time it was removed, knowing it to be a malignant growth, and the third time it was destroyed as thoroughly as possible with the galvano-cautery. The tissues were so much involved that there was absolutely nothing that could be removed without destroying the sclerotic. Nearly one-third of the corneal surface and quite an area of conjunctiva was burnt. It has been now nearly three years this spring since the operation, and there are no indications of its recurrence. There was a good deal of astigmatism following the burning, but the eye assumed its normal condition, and the translucency of the cornea is good and vision is better than it is in the other eye.

Dr. W. F. Coleman related a case of *Primary Epithelioma of the Globe* that came under his observation some eight years ago. A man, 40 years of age, presented himself with a growth on the left sclera between the cornea and external canthus. The growth was circumscribed and slightly pedunculated. The man objected to having it snipped off and returned in about six months, when it had increased to the size of a small bean. Owing to the rapidity of its growth and its vascularity, it was diagnosed as an epithelioma and removed. The growth was given to Dr. Casey A. Wood for examination, who pronounced it epithelioma.

Dr. W. A. Fisher exhibited an interesting case of *Paralysis of Both Abducens with Contraction*, not only of the muscles that rotate the eye inward, but of the orbital tissues.

(The report of this case will appear in the May number of THE OPHTHALMIC RECORD.)

Discussion.—Dr. J. E. Colburn saw a patient last winter with one eye very much in the same position that we find this patient's two eyes, and with a history that, when six years of age, the eye became convergent and had remained in its converged position ever since. When seen by Dr. Colburn the conjunctiva was red from exposure. He was an out-of-door man. Enucleation was advised, as the other eye was perfectly good, and the affected one was very unsightly. Before advising enucleation, however, and after using cocaine, it was found that the eye could not be rotated outward by forcible means. It was about one-third longer than the normal eye in its antero-posterior diameter, and very irregular in form. The abductor muscle could not be found, and the adductor muscle was almost equally obliterated, but the connective tissue at the inner canthus was firm and cicatricial. The man assured me that so far as he knew he had never had any inflammatory condition of the eye.

Dr. William L. Ballenger showed a specimen of a *Foreign body removed from the nose* of a man 60 years of age, at the Illinois Eye and Ear Infirmary, some two or three months ago. An offensive odor from nose had been present for about thirty years. Upon examination, it was found to be the breech pin and nipple of an old-fashioned percussion cap musket. The man stated that thirty years ago a gun had exploded, destroying his left eye. This portion of the gun had passed in through the orbit, and possibly lodged in the ethmoidal cells, or in the antrum of Highmore. After a time, the walls sloughed away and the specimen lay loose in the nose. It could be moved back and forth an inch and a half, and was removed with the aid of a strong pair of dressing forceps. The specimen weighed, at time of removal, 325 grains.

Dr. C. D. Wescott reported the case of a woman, 73 years of age, who came to have an operation for *Cataract.* She gave a history of blindness in one eye for twenty-five years. There had been no involvement of the other eye until very recently. Beginning, peripheral changes were present in the lens of the good eye, with some senile changes in the fundus, and gave a very unfavorable prognosis in regard to the other eye. Dr. Wescott expected to encounter a Morgagnian cataract, but on rupturing the thickened and opaque capsule, the contents proved to be entirely fluid and about the consistency of ordinary pus. There was a good deal of cholesterin present, and some gelatinous matter, but there was absolutely no trace of solid nucleus. The contents were coaxed away, by gentle manipulation of the cornea, without any difficulty, and the capsule extracted entire with the iris forceps. Healing was ideal, with scarcely any hyperemia of the eye at any time. Bandage was discarded on the seventh day after operation, and vision, with correction, two weeks after operation is $\frac{2}{100}$, although the eye had been divergent for many years, and for twenty-five years she had seen nothing with it. It was interesting to see the eye straighten up, and vision gradually come to it, as the tests were made. Examination with oblique illumination shows a single thread of capsule across the pupil, and a number of cholesterin crystals can be seen clinging to it. The iris is tremulous, just as we see it in cases of dislocation of the lens.

Dr. F. C. Hotz: In regard to Morgagnian cataracts without solid nucleus, these cases are rare. Usually, we find small, solid, lenticular nuclei, and if the capsule is clear the optical results are very good. It is surprising that Dr. Wescott did not get more vision than $\frac{20}{100}$ in his case, and it would be interesting to watch it and see whether education will bring back the sight; whether it is a case of amblyopia from non-use; as this is still an unsettled question. It would be interesting to see whether the vision of the operated eye will gradually improve when the cataract in the other eye progresses so as to make its sight dim and useless.

Dr. C. D. Wescott: Undoubtedly vision will never be good, because of the amount of choroiditis in the eye. Both eyes are equally involved in senile changes of the choroid. However, as it is not uncommon to see vision of $\frac{20}{70}$ or $\frac{20}{100}$ two weeks after operation increase to $\frac{20}{30}$ and better, it may do so in this case. Patient did not recollect how many years the eye had been divergent.

Dr. K. K. Wheelock, of Fort Wayne, Ind., showed a brain with a tumor at its base taken from a case in which there was present optic nerve atrophy with total blindness.

REVIEWS.

IN WHAT CASES AND WHEN TO ENUCLEATE IN INJURIES OF THE EYE.

By John M. Foster, M. D. *Journal American Medical Association.* January 1, 1898.

Dr. Foster deplores the uncertainty, anxiety and solicitude attending treatment of certain injuries to the eye, especially of penetrating wounds in the ciliary region. He calls attention to the fact that long clinical experience is unable to determine, with any degree of precision, whether sympathetic ophthalmia or panophthalmitis will occur in one case, and why it should or should not occur in another. That on the one hand these injuries are often followed by most serious results, while on the other, "how frequently we note the termination of these unfavorably appearing cases in kindly healing," etc.

Doctor Foster rightly, I think, lays stress on the uncertainty "and the dreadful consequences that are liable to follow these injuries," and the fact that we cannot feel sure that any age, sex or condition renders the uninjured eye exempt from sympathetic effects. That the question of immunity seems to elude us, though the influence of age is perceptible; " for we have ascertained that children under the age of puberty are more prone to sympathetic ophthalmia after injuries than at any other period of life. We have not been able to go further, however, and determine any time at which there is any degree of immunity."

And here let me say: To determine this we must, I think, seek other facts than those discoverable solely through clinical experience. I am persuaded that not enough attention is given to research in ontogeny and phylogeny in our attempts to meet pathologic disturbances whether caused by direct casualty or by indirection. This holds good both as to organs separately considered and to the organism as a whole. And, broad as the statement may seem, I am of the belief that until the *true* physiology of the eye is understood—until a proper perspective of function is obtained in relation to ontogenetic and phylogenetic growth—until the process of cell differentiation and specialization, and stages of metamorphosis are more clearly determinable, and until the effects are better known of the backward and forward influences of *causæ efficientes*, together with the certain ever present general relationship between even remotest organs of the same organism, little real progress can be expected in this line.

But to take up the thread of review again: Doctor Foster calls attention to the points to consider in accidental injuries to the eye; first, the character, and second, the location of the injury, since upon these depend, in large measure, prognosis and treatment.

As is the general experience, I believe, of most of us who work in this line, he finds that the percentage of serious sympathetic trouble is very small in the class of injuries produced by blows with dull instruments, even in cases of severe contusions and hurt to "the coverings and appendages to the eye, without solution of the continuity of the ball itself." So small, indeed, is the percentage, that he records but *two* out of six hundred cases.

"It is a far different matter, however, when we deal with a penetrating or poisoned wound, even if the instrument or particle producing it is *not* left in the globe. Its presence, nevertheless, adds that much more to the gravity of the case; while a demonstration of its absence, which is not always an easy matter, does not give a sense of relief or a feeling of security. In any event, we have a serious condition before us, which is influenced by several factors, viz., depth, position and character of the wound, as well as the presence or absence of a foreign body, all serious questions demanding serious consideration."

He clearly points out some prominent factors in the prognosis. For instance, a lacerated, gaping wound in the ciliary region would be considered serious in comparison with a similar wound in the conjunctiva remote from this region, and urges that while a wound of this nature, even with the foreign body present in the ball, is not *per se* an indication for enucleation; still, it is demanded in the great majority of cases, especially where there is "excessive pain, indication of purulent inflammation in the affected eye, or if there is irritation, shyness of light, corneal haziness or discoloration of the iris, however slight, in the uninjured eye." He favors, as a rule, enucleation in cases of wounds infected with bacteria "of any description," though very sensibly, in my judgment, opposes the foolish theory of migration of bacteria through the optic nerve. It is much more rational to suppose, with Doctor Foster and others, that sympathetic ophthalmia is due primarily to irritation of the ciliary nerves disturbing the nutrition and, therefore, normal metabolism of cells in the uninjured eye, not forgetting, of course, the close and more or less clearly defined "relations between the lymph channels and spaces."

The different theories of the *cause* of the trouble, however, are lightly passed. And I find Dr. Foster's experience to tally with mine, in that the simple nerve section does not equal "enucleation as a preventive measure against sympathetic ophthalmia." Indeed, I regard "nerve section" in these cases as a "delusion and a snare."

He cautions that it is well to remember the rarity of the disease, that the operation in general is prophylactic, and should therefore be done early; but that even in cases of long standing and when the sympathetic trouble occurs *after* enucleation, the inflammation is less virulent as the operation is recent.

He advises careful consideration of penetrating wounds of the ciliary region and against operating in every case. That the operation should be governed, not so much by the situation of the wound, but by symptoms of marked inflammation in the injured eye and of photophobia in the uninjured one, and when panophthalmitis is threatened; and that the operation, when indicated, should be made as soon as possible. He thinks, and I believe it is generally conceded, that sympathetic ophthalmitis seldom follows prophylactic enucleation, but that on the other hand, in many cases, it establishes a cure when the symptoms have been marked for several weeks. "As a rule, however, in case the trouble has commenced, the primarily affected eye should only be removed after the inflammation has been so severe and lasted so long that there can be no hope of restoring vision. If sympathetic ophthalmitis affects the sound eye shortly after an enucleation of the injured, we feel certain that ill-defined and veiled symptoms have been overlooked, and it had already begun to suffer before the operation was performed."

In concluding, he advises early enucleation in panophthalmitis for fear of meningitis following, and leans strongly toward the operative side when positive that no sight will be regained in the injured eye. Fewer mistakes have been made in following this rule than in awaiting future results.

Altogether his paper is admirable, suggestive, and stimulating. He treats a subject of importance, and handles it well.

A. W. CALHOUN.

A CONTRIBUTION TO OUR KNOWLEDGE OF THE CONNECTION BETWEEN THE CILIARY GANGLION AND THE PUPILLARY REACTION.—By Dr. St. Bernheimer. Græfe's *Archiv. für Ophthalmologie*, XLIV, 3. The current number of *Græfe's Archives* contains an interesting paper by Bernheimer, in which he describes conditions as he finds them microscopically in the ciliary ganglion after the corresponding eye of the animal had been submitted to certain artificial conditions. The author in introducing the subject states that it frequently happens in tabes, progressive paralysis, and other diseases of the nervous system due to syphilis; that an early symptom noticed is an isolated and persistent disturbance of the pupillary reaction, the reflex rigidity of the pupil. Insomuch as pathological examination of the oculomotor center to explain lesions of this sort frequently fail to give positive results, although the nature of the trouble and its strict isolation to a part supplied by the nerve would make it seem a nuclear lesion, it would suggest the question, whether the primary cause in similar cases should always be sought for in the oculomotor center. It is conceivable that the trouble may primarily affect any part of the reflex arc, while the secondary changes in the center are only implanted later, and are of such a nature as not to be readily detected. Quite recently, Marina in his monograph on Multiple Ocular Paralyses, questions whether the center for pupillary contraction is, in man, always in the oculomotor nucleus, and suggests that the frequency of the fixed pupil in tabes bespeaks the existence of an extra cerebral, or at least a second center placed between the oculomotor and the short ciliary nerves, to which a higher significance must be ascribed. This conception is entirely in accord with the neuron theory, and in an affection of the neuron of the ciliary ganglion, the progress would be along the short ciliary nerves, the ciliary ganglion, the pupil-contracting fibers in the oculomotor stem, and so on to the corpora quadrigemina. The fact that pupillary movements may remain unimpaired in neuritis of the oculomotor supports the theory that the principal center of pupillary contraction may be peripherally placed as regards the oculomotor trunk, i. e., in the ciliary ganglion. Because the convergence reaction is present while the reflex pupillary reaction is absent does not seem to be a sufficient reason for discarding the proposed hypothesis. After successfully localizing the center for the internal muscles, in monkeys, in the nuclei lying along the median line and proving them to be distinct from the centers governing the external muscles, an attempt was made to apply the hypothesis to the ciliary ganglion. To this end, ten days after the destruction of the iris, ciliary body and ciliary nerves of one eye of a monkey by exenteration, the animal was killed and both ciliary ganglia were removed and treated according to the method of Neissl, serial sections being made in paraffine. The sections of the ganglion belonging to the unoperated eye were similar in appearance, there being clusters of cells lying in a pericellular tissue, in which were small clear spaces. Although protoplasmic prolongations were not actually made out by this method of staining, there were slight, barely recognizable, projections, probably due to a localized retraction of the cell wall. It was difficult to determine whether the cells were bi- or multi-polar, which is remarkable, as cells of other localities are satisfactorily colored in this respect. Michel believes the cells of the ciliary ganglion in man to be multipolar, and has been able to demonstrate the axis cylinder and other processes by the Golgi method, and it is probably reasonable to so consider the ganglia of the monkey. The cells themselves have a central nucleus and a darker nucleolus. In the longer cells the stain seems to be more pronounced at the ends. The serial sections of the ganglion of the operated eye appear very differently, some of the cells being rounder and swollen, while others are smaller and shrunken, the nucleus, if made out at all, being pushed off to one side and flattened. The coloring matter no longer appears in well-defined areas, but rather in pale blue, finely granular and dust-like masses. Cells perfectly normal were not found. In order to determine whether fibers coming from the cells of the ciliary ganglion actually control the iris and ciliary body, and whether an original lesion in that ganglion could cause "pupillenstarre," the right cornea of a monkey was completely destroyed by repeated galvano-cauterizations, and after ten days the animal was killed and the two ciliary ganglia treated as before. The sections of the ganglion belonging to the sound eye were, without exception, normal. Some of the sections of the ganglion on the side of the operated eye contained cells which, though apparently normal, were certainly less deeply stained than common, and in possibly one-third of these sections were cells showing positive signs of degeneration. Some of these cells were round and swollen, the stain appearing finely granular. The nucleus was either displaced to one side or had disappeared. In some of the sections the cells showing degeneration were collected in groups, and in others they were scattered singly among the normal cells. Before attempting to explain these findings, the results of others were briefly summarized. On the basis of his anatomical studies, Schwalbe believes the ciliary ganglion to be a structure belonging exclusively to the oculomotor, and therefore acquires the importance of a spinal ganglion; this was afterwards confirmed by Goldberg. Holzmann finds that the ciliary ganglion differs histologically in different animals; thus, in the frog are found perfect spinal cells, while in birds, which have a one-sided development, were found cerebro-spinal elements alone. Although in dogs there was deviation in location and structure of the ciliary ganglion, still the sympathetic elements preponderated; in the cat, the sympathetic was solely developed. Michel considered the ciliary ganglion in man and calves to be a sympathetic structure. Analogous to these histological deviations, differences in the atropine effect were noticed; for instance, in those animals in which the ganglion was made up wholly or in part of sympathetic cells, paralysis of the iris and ciliary body was greater, while in birds, whose ganglia was made up of cerebro-spinal cells alone, no effect was noticed. The careful embryological work of His, Remac, and Phisalix are in support of the view that the ciliary ganglion is spinal in character and belongs to the trigeminus. Krause believes in the double character of the ganglion, while Van Gehuchten, who, with Retzius and v. Michel, has used the Golgi method, is inclined to differ with the other two observers in classifying it among the spinal ganglia. Kolliker is inclined to think that the ganglion contains only multipolar cells, and that it is purely sympathetic.

The fine medullated fibers proceeding from the multipolar cells are cellulifugal in their action. v. Kolliker, on the one hand, supports his claims by the histological findings of Rauber and others, according to whom the ganglion contains only multipolar sympathetic cells, and on the other hand by the physiological experiments of von Langley and others. Langley and Anderson suggest that the arrectores pilorum of the cat are under the influence of certain rami communicantes of the anterior spinal roots, but that this influence is carried over by nerve fibers which arise in the sympathetic system, and the oculomotor acts in an analogous way, not directly upon the sphincter of the pupil, but through the intervention of the ciliary ganglion. Langendorff found that electrical irritation of the oculomotor of the cat within the skull caused no contraction of the pupil, but only when the oculomotor was irritated immediately after death was there any perceptible narrowing; but, if the short ciliary nerves are irritated, the contraction comes on a longer period after death. He concludes from this that the pupil-contracting fibers of the oculomotor in the ganglion do not simply pass through the ganglion, but that in the ganglion are cells in the pupil-contracting tract, to whose early death the failure of the proximal irritation of the nerve trunk is due. To decide whether the ciliary ganglion is to be considered as sympathetic, spinal or mixed, the following must be considered: In the ciliary body of monkeys are nerve fibers which supply not only the iris and ciliary body, but also the cornea. If the same condition obtains in man, it is possible that disease of the ganglion can give rise to a fixed pupil. Changes in the cornea must of necessity appear in disease of the cells of the ganglion, with disturbances of the pupillary reaction. It seems reasonable to suppose that those fibers which, after destruction of the cornea, call forth degeneration of certain cells of the ciliary ganglion are sensitive fibers supplied to the cornea, and press in between the corneal epithelium. The views of His and others who consider the ganglion as sensitive and ascribe it to the sympathetic seem reasonable. If the views of Kolliker are accepted, that the ganglion is to be considered as purely sympathetic and as analogous to the rest of the peripheral ganglia of the sympathetic, it must send out cellulifugal fibers; fibers which are purely motor or secretory, and from which all sensitive function is absent. In this case the vascular nerves of the cornea must be made answerable for the changes in the cells of the ganglion. Of course, it must be remembered that the cornea, properly speaking, has no vascular system of its own except the terminal loops from the conjunctival vessels of the limbus. It is scarcely to be considered reasonable that the degeneration noticed in the ganglion can be ascribed to those few insignificant vascular nerves.

WM. DUDLEY HALL.

The following was inadvertently omitted from Dr. Whitcomb's article on " Extra Fronts," in the February number of THE RECORD. It should follow immediately after "Second:" "The lenses should be concavo-convex, of suitable curves. In fitting them into the frames, they should be beveled mostly on the convex surface to allow the eye-wire to come flush with, or even a little beyond the posterior, or concave surface, so that in adjusting or removing them, the glass surfaces can by no means come into contact."

NEWS ITEMS.

Personals and items of interest should be sent to
Dr. Frank Allport, 92 State St., Chicago.

Among the papers to be read at the forthcoming meeting of the Ophthalmological Section of the American Medical Association, are the following:

Dr. de Schweinitz, Philadelphia, The Pathology of Toxic Amblyopia.

Dr. Jackson, Philadelphia, The Pathology of Cataract.

Dr. Casey Wood, Chicago, The Clinical Aspects of Toxic Amblyopia.

Dr. Ellett, Memphis, Some Severe Cases of Tobacco and Quinine Amblyopia.

Dr. Young, Burlington, Ia., Amblyopia from Auto-intoxication.

Dr. Ziegler, Philadelphia, The Uses of Electricity in Ophthalmology.

Dr. Starkey, Chicago, Some Uses of Electricity in Ophthalmic Practice.

Dr. Gradle, Chicago, An Easily Overlooked Form of Keratitis.

Dr. Eaton, San José, Eye Muscle Test With Colored Glasses.

Dr. J. A. Mullen, Houston, The Percentage of Color Blindness to Normal Vision, as Computed from 308,919 Cases.

Dr. F. C. Heath, Indianapolis, Accidents in Eye Operations.

Dr. D. S. Reynolds, Louisville, Phlyctenular Keratitis.

Dr. E. O. Sisson, Keokuk, Bacteria One of the Chief Etiological Factors in Diseases of the Eye.

Dr. Geo. M. Gould, Philadelphia, Mydriatics in Presbyopia.

Dr. J. L. Thompson, Indianapolis, The Treatment of Affections of the Lacrymal Apparatus.

Dr. J. O. McReynolds, Dallas, Additional Notes on the Employment of Absorbable Sutures in the Operation of "Looping" Tendons of Ocular Muscles.

Dr. Leartus Connor, Detroit, The Treatment of Diseases of the Lacrymal Apparatus.

Dr. H. O. Reik, Baltimore, The Value of Large Probes in the Treatment of Strictures in the Nasal Duct.

Dr. Melville Black, Denver, The Uses of Large Lacrymal Probes.

Dr. Bane, Denver, Regular Astigmatism is not Always Congenital, Neither is it Unchangeable.

Dr. Ball, St. Louis, Report of a Case of Quinine Amaurosis.

Dr. Savage, Nashville, The Field of Fixation, or the Home of the Guiding Sensation.

Dr. Moulton, Fort Smith, Treatment of Blepharitis with Formalin.

Dr. D. C. Bryant, Omaha, The Uses of Aluminum for an Artificial Vitreous.

Many other papers have been promised, titles of which will be sent later.

Sanitatgrath Dr. L. Alexander, well known as the author of "Syphilis and the Eye," died October 17, 1897, in Aachen.

Prof. Dr. Rudolph Berlin, of Rostock, died September 12, 1897, in Stachelberg, Switzerland. He edited the *Zeitschrift für vergleichende Augenheilkunde*, together with Everbusch, and his writings are well known.

Prof. Dr. Axenfeld has been appointed to the chair of ophthalmology, in Rostock, made vacant by the death of Professor Berlin.

Prof. Dr. Max Burchardt, director of the eye department of the Charité, died September 26, 1897, in Berlin.

Prof. A. Anagnostakis died in Athens, aged 71.

Dr. Topolanski has been appointed privat-docent of ophthalmology to the University of Vienna.

Privat-docent Dr. Greef has been appointed director of the eye department of the Berlin Charité.

Dr. M. Peschel, of Turin, has been appointed a. o. Professor of Ophthalmology.

THE

OPHTHALMIC RECORD

A MONTHLY REVIEW OF THE PROGRESS OF OPHTHALMOLOGY.

VOLUME VII. CHICAGO, MAY, 1898. No. 5. NEW SERIES

ORIGINAL ARTICLES.

OPHTHALMOLOGY IN JAPAN.

Abstract from a letter sent to Dr. Charles A. Oliver of Philadelphia by Dr. Wm. N. Whitney of Tokio, Japan, under date of Feb. 4, 1898.

"I took some photographic snapshots a few days since. Here is one of the inside of our hospital waiting-room, taken about 10 A.M.

"I go to the hospital as soon after 8 A.M. as I can get there, and remain until 11:45 A.M., when I come home and get my dinner, and then go by the 1 P.M. train to Yokohama daily, except Saturdays and Sundays. The young man on the front seat of the photograph is Dr. Sonobe, who spent a part of his time in your city. The little girl next to him came in with purulent ophthalmia, which had resulted in staphyloma of the right cornea. I attempted to reduce the staphyloma after the discharge had stopped, but did not succeed until the cornea had given away and the lens in its capsule presented, which was duly incised with a cataract needle and the lens substance removed. The cornea has since collapsed, and the patient appears in a fair way to have a fairly well-shaped eyeball. The boy next to her had an infected elongating marginal ulcer in the left eye, which I succeeded in getting to heal with applications of fifty per cent. strength solution of lactic acid until the ulcer scar did not stain with fluorescein. I then allowed him to go out, but in a few days had him back with swollen lids, a steamy cornea, and a membranous deposit on the lower lid. The membrane was removed with difficulty, and, as I feared it might be a diphtheritic case, I obtained some antitoxin serum and papain, but found it to be a false alarm, although the membrane continued to form in patches. A deep central ulcer soon appeared, which is now healing.

"A few days ago I saw a young subject in whom a cornea had been cut with a nail nearly across and through sufficiently to allow a part of the lens to escape. I opened the anterior chamber, which was leaking, and removed as much of the opaque and softened lens substance as would come away, including a few drops of vitreous humor which accidentally escaped. The case improved, and I thought I was going to save the eyeball, although he only came to me on the fourth day, after a fifty-mile railroad journey. After improving considerably, however, he had an urgent call to go home, whither he returned much against my advice. Ten days later he returned, with the eye doing fairly well, the pouting corneal wound having rounded off. On the next day, however, pain became intense, and I thought I had a glaucomatous state to deal with, as the eyeball became hard. The capsule of the lens and a corner of the iris had originally caught in the wound, so I made an opening with a small needle and incised the capsular membrane, which divided the anterior chamber into two laterally placed compartments. I also endeavored to relieve the portion of the iris which had been caught in the wound. I succeeded in so doing, but considerable reaction set in, rendering it necessary for me to suggest the removal of the eyeball.

"I had a child who had received a wound from a bamboo dart blown from an air-gun. All I could see was a small hole in the center of the cornea filled with lymph, which later stained with fluorescein. The anterior chamber was gone, and the iris was spread out over the inner surface of the cornea and caught in the corneal wound. The child is under treatment now.

"We have many cases of ulcer of the cornea of all kinds, the majority of which I find I can stop with fifty per cent. strength lactic acid applications made with a fine Japanese brush if seen early enough."

"AUTOPHAKOSCOPY."

BY S. MITCHELL, M.D.
Oculist and Aurist to St. James' Mercy Hospital, Oculist to the Erie Railroad.
HORNELLSVILLE, N. Y.

In No. 1 of Vol. V, of the *Annals of Ophthalmology*, there appears a short article written by me on autophakoscopy, as practiced by the aid of a polished convex surface (a plain gold ring). This article closes with these words: "That, inasmuch as this observation was made in such a peculiar manner, and from rays of light reflected from a convex surface of an opaque substance, there might be in it greater possibilities for some one who possessed the time and inclination to further pursue this interesting subject." Hence it will be seen that I did not then intend to make any further investigations along this line. I am sure I should not have written again upon this theme, were it not for the fact that the phenomenon, the particulars of which I shall presently relate, so frequently and persistently attracted my attention that I have felt impelled to relate my experience. The discovery of this method was brought about by an accident. Nothing more serious, however, than having the right lens of my eyeglasses well sprinkled with some of the fluid with which I was spraying a patient's nose, an accident that has doubtless happened to all when similarly engaged, provided they were wearing glasses at the time.

When looking directly at the arc light on the street corner near my office, through the lens to which small globules of the fluid were clinging, I saw the luminous disc mentioned by Dr. Darier, with great clearness, and of such increased size that all observations were greatly facilitated. These particulars were especially noticeable whenever a little effort was made to bring a large globule in the direct line of vision. The appearance of the physiological floating bodies in the vitreous, as seen by this experiment, is very striking and beautiful. A sudden movement of the eyeball imparts to them a motion like the undulations of a perfectly limpid fluid, like what may be witnessed when alcohol is poured in a glass of clear water when it is held up to the light.

There is a golden tinge to the luminous disc as produced by Dr. Darier's experiment, as well as by the one mentioned in my previous article, that is entirely absent here, so that the outline of all floating bodies in the vitreous could not be seen any more perfectly if they were under the microscope. The stria in the crystalline lens and the movement of drops of mucus and tears across the surface of the cornea, are not seen by this experiment; it is only possible to watch the movement of the muscæ volitantes. Just why this is so I am unable to explain. To designate this procedure as autophakoscopy is evidently a misnomer, since the stria in the crystalline lens is not seen; this body being one part of the eye that escapes our scrutiny when practicing this method. But for the want of a better name I decided to publish this article under the old title.

The result of several experiments have fully satisfied me that autophakoscopy by this method may be practiced with any lens, provided it is held before the eye in the same position as when used for visual purposes, and is one that in no way interferes with acuteness of vision. A globule of water or colorless liquid albolene, adhering to the outer surface of the lens, is the essential part of the apparatus used in the production of this peculiar phenomenon.

Autophakoscopy, however practiced, does not seem to possess any features that tend to make it of value to the ophthalmologist in clinical work. It does not "fill a long-felt want" as did ophthalmoscopy for our fathers, and as skiascopy and ophthalmometry have done for the modern oculist. It is doubtless destined to occupy about the same position as to usefulness in the realm of science, as is accorded the butterfly in the realm of nature.

SOME NEW METHODS OF EXAMINATION OF THE POSITIONS OF THE VERTICAL MERIDIANS OF THE RETINA

WITH A DESCRIPTION OF A METHOD FOR OPERATIVE CORRECTION IN CASES OF ANOMALOUS DECLINATIONS.

BY GEORGE T. STEVENS, M. D.,

OF NEW YORK.

Illustrated.

Since the introduction of the clinoscope the subject of the position of the vertical meridians of the retina has assumed a new and important place in the examinations of the eyes. We are now in position, as we have never before been, to determine quickly and easily the presence of any leaning of these meridians, either through disease or through physiological causes. The easy and certain detection of such leaning has enabled me to discover the essential element in many cases which were otherwise obscure and troublesome functional disturbances of the eyes, and to find a remedy. It is the class of cases of leaning from physiological causes which appears to me to be of by far the greatest interest, and I find that the number of such in which the adjustment of the eye muscles is such as to deflect the vertical meridian materially toward one side or the other, thus causing an excessive demand upon the torsional muscles, is much larger than I had expected.

The subject then passes beyond the domain of merely physiological research, to which it seemed to belong, and becomes one of much practical importance.

Recognizing this, I became interested in the search for methods of examination which might become general.

The clinoscope is doubtless more perfectly adapted for these examinations than any other form of instrument which we are likely to possess; but it is an instrument which requires space, and which, since several later improvements have been added to it, has become somewhat expensive.

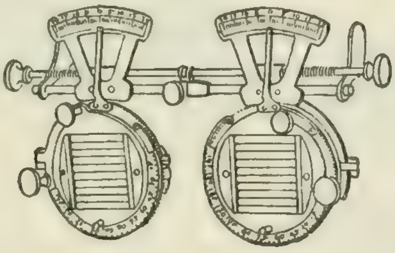


Fig. 1.

So far as my search has extended, I do not think that any substitute which I am about to describe can take the place of the tubular clinoscope first described and since improved. But at least one of the devices, which I shall presently mention, may be of material service to those who would prefer the use of a simple and comparatively inexpensive instrument to using none at all.

My first experiments in this direction were commenced in September last with a pair of disks, each containing a series of glass rods such as was suggested by Dr. Aiken as a modification of the Maddox rod.

The result was an instrument very interesting, but not very satisfactory. The disks are placed in a frame like the trial frame of the Nachet trial case. It is designed to hang upon the slide of the phorometer, the prisms of which, when placed with their bases in, serve to separate the images seen through the series of rods. A milled head with cogs rotates each disk, and a scale and pointer indicate the extent of rotation. (See Fig. 1.)

The instrument being hung upon the phorometer slide, and the arm of the phorometer being brought to the horizontal position, the image of the candle flame at the other side of the room is seen as two long streaks of light. The disks are rotated until the streaks are as nearly as possible vertical, and therefore parallel. I have said "as nearly as possible vertical and parallel," for these lines are always curved, and this curvature renders it difficult to determine when they would otherwise be parallel and vertical. A still more important disadvantage is found in the changes in the directions of the lines due to the position of each eye in regard to one of the rods. If, for example, one eye looks through the lower border of a rod and the other through the upper border of another, the position of the lines is quite different from what it would be if both eyes were looking through corresponding parts of two rods in the same horizontal plane. In order to eliminate some of the difficulties, I had small plates of glass cut with a series of prisms, fifteen prisms extending from one side to the other of a plate three-quarters of an inch square, and substituted these plates for the series of rods.

The bending of the streaks of light was somewhat less, but the variations in the positions of the lines were not overcome.

After I had experimented with this instrument for some time, I learned that Doctor E. P. Brewer had had one constructed on the principle of using the double series of rods but with quite different mechanism from that described, and that his instrument antedates my own. I have not seen a description of the Doctor Brewer's device, and do not know whether he has overcome the difficulties which I have encountered. For the purpose of exercising the torsional muscles, this instrument may be used without the prisms of the phorometer. The two lines then unite, and by rotating the disks the effort to hold them in union is drawn forth. Two such disks held in the hands will, however, serve an equally good purpose.

The second device which I have had made appears to be more successful, and it is possible that with some slight modifications it may prove a very satisfactory instrument.

It consists of two oculars, made each in the form of the ocular of the tropometer. Each consists of a magnifying system with a concave and convex lens, and of a glass screen on which is drawn one part of a haploscopic diagram. When seen with the two eyes these parts of the diagram unite as in case of the stereoscope. The lens system can be focused on the diagram so that the latter may be clearly seen by persons with different refractions.

These two oculars are fitted to a frame which is to be placed on the arm of the phorometer (not on the slide). An endless screw causes them to approach or to recede from each other, thus adjusting the two small openings to the pupillary distance of the observer. (See Fig. 2.)

The glass on which the diagram is drawn rotates by means of a cog-wheel, and a pointer indicates, on a scale above, the declination of the diagram.

The necessity of seeing through the two small openings at the same time insures a level for the two eyes, and the strong magnifying property of the oculars makes the lines of the diagram appear of a length which enables the person examined to determine with ease when the lines appear vertical.

There is, in using the instrument, neither convergence nor accommodation demanded, and there would seem to be no theoretical reason why there should be a leaning of the lines so long as the line of vision passes through the exact center of the lens. Of course, if the line of sight does not correspond with the axis of the lens system, a declination of the image will be induced.

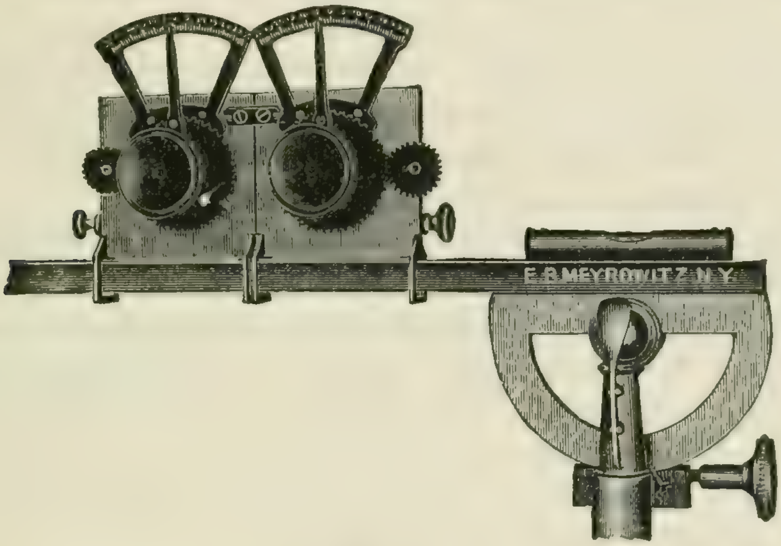


FIG. 2.

In using the instrument myself I find a perfect uniformity of results and a correspondence with the results by the clinoscope. Many of my patients also find the same results. There is, however, a certain small proportion, who, although they reach uniform results with the clinoscope do not do so with this, which I may call *the lens clinoscope.* In a new model, now in process of construction, I am endeavoring, with a reasonable hope of success, to remove this difficulty, which probably arises from a false direction of the line of sight.

With slight modification the instrument constitutes a beautifully compact stereoscope, in which pictures of less than one-fourth of an inch in diameter appear of the usual size employed for stereoscopic figures. The two images blend without the aid of a prism such as is necessary in the ordinary form of stereoscope.

OPERATIVE TREATMENT FOR ANOMALOUS DECLINATIONS OF THE VERTICAL MERIDIANS.

I have now to speak briefly of a method of operative correction which I have practiced for rather more than a year, and which I may, therefore, speak of with the benefit of some experience. On the whole, the results have been satisfactory, but the more recent operations have proved especially successful.

The cases operated on have been physiological declinations of a sufficient degree to cause much disturbance. The procedure is as follows: Let it be supposed that the correction is to be made on the right eye for a declination of $+3°$ or $+4°$. In this case the vertical meridian leans with its upper end outwards or towards the right. The object is to bring the upper end towards the center or somewhat to the left, to the extent of making it finally, as nearly as possible, vertical.

A small incision is made by the tenotomy scissors through the conjunctiva over the lower border of the insertion of the internal rectus. The border of the tendon is caught by the small forceps, and is separated from the sclera from the border upwards a few millimeters, depending for extent on the amount of torsion proposed. Care must be observed to preserve the extreme border of the tendon and the relaxation is carried toward or slightly beyond the center. Then a similar relaxation is done on the upper half of the external rectus.

In certain cases the torsion may be affected by traction on the opposite halves of the muscles. After the section as above, but done at the superior part of the internus, the fine sharp hook is introduced through the small opening and passed back between the tendon and sclera where the free border is caught and drawn forward. An extremely fine suture is passed through it, and the two ends are then passed through the conjunctiva in a pocket prepared beforehand, when the border of the tendon is drawn into the pocket and fastened as in my operation for advancement. As the result of this proceeding there will be right hyperphoria and esophoria, or more correctly, right hypertropia and esotropia. A similar operation is then done on the lower border of the external rectus. If the two operations are graduated with sufficient care, the heterotropia caused by the first operation will be so largely neutralized that there will remain a condition of orthophoria, or one so near it that that condition may be expected on the following day.

When healing takes place after either of these procedures there is such a readjustment of the insertions of these two muscles that there is a partial or complete correction of the leaning of the meridians according as the operation has been more or less exactly graduated.

Such an operation is, of course, one demanding much delicacy of handling, but can be done with the most gratifying success if all the stages are well considered and properly executed.

In cases where an operation for anophoria or for hyperphoria on a superior rectus is to be done, the proceeding is different. In such cases the relaxation of the superior rectus of the eye on which it is desired to induce the torsion is carried to an extent slightly in excess of that which is required, but without freeing either border of the tendon from its attachment to the sclera. Then, introducing the fine hook at the outer third of the tendon, in case the tilting is out, at the inner third if the leaning is negative, the border of the tendon is brought forward, and a suture is inserted and drawn sufficiently to insure a neutralization of the overcorrection of the hyperphoria or anophoria.

In my earlier operations the torsion was done on the superior and inferior rectus in the manner described for the lateral muscles, but I have found the operations on the external and internal rectus more effectual and less difficult.

33 W. Thirty-third street.

A CASE OF TENONITIS.

BY E. C. ELLETT, M. D.

Formerly House Surgeon in the Wills' Eye Hospital, Philadelphia; Ophthalmic and Aural Surgeon to St. Joseph's Hospital and to the Children's Home, Memphis, Tenn.

OF MEMPHIS, TENN.

Illustrated.

On account of the rarity of the condition, I wish to record the following case, which is the second of the kind that I have seen:

On May 1, 1897, I was asked by Dr. Farrington to see a colored girl in the city hospital, for an eye trouble. She was sixteen years old, and gave the following history: Four weeks previously she had had a chill, followed by a rise of temperature, and two days later the right eye protruded. In a few days more the left eye became similarly affected. She was seen by several physicians and variously treated according to the different diagnosis each made, until Dr. Farrington was called, and had her brought to the hospital.

I found marked exophthalmos, affecting both eyes, with a fold of œdematous conjunctiva protruding from the lower portion of each ball, overhanging the lower lids, and preventing closure of the lids. The conjunctivæ were injected, and there was a very moderate muco-purulent discharge. The condition was most marked in the left eye, and in this eye the lower third of the cornea was infiltrated, no doubt from exposure and "strangulation." The motion of the eyes was somewhat limited; there was no ocular pain, but some photophobia and a good deal of pain in the top of the head. The temperature was a little elevated, running from 99 to 100; otherwise the general condition was good. I was unable to obtain a view of the eye grounds, as there were no facilities at the hospital for ophthalmoscopic work, and the condition of the eyes made it very difficult. There was a good reflex, movable pupils, and as far as I could determine, no impairment of vision.

I was considerably puzzled to make out the diagnosis. The sudden onset of the trouble pointed to an inflammatory process, and my first thought was of double ethmoiditis, having ruptured through the os planum and forming a collection of pus behind each eyeball. The rise of temperature favored this view. There were no intranasal evidences of ethmoidal disease, but nevertheless I had the patient anesthetized on May 4th, and made a small opening at the upper and inner corner of each orbit, to the periosteum, and, keeping underneath this membrane, passed a probe back to the os planum. The result was negative on both sides, and this condition being eliminated, I came to the conclusion that the case was one of double tenonitis. I ordered hot compresses, and fifteen grains of salicylate of soda every two hours. This was continued with marked benefit till the 10th, when, on account of nausea and tinnitus the salicylate was given every four hours, and the hot compresses stopped. The exophthalmos, chemosis and injection, was much better. The cornea did not ulcerate, but an opacity remained at the seat of the infiltration. She was subsequently put on the iodide of potash, with a return to the salicylates for a few days on account of pain in the head. She was dismissed on June 1st, the right eye being well, the left still showing a small roll of hypertrophic conjunctiva below the cornea. I noticed considerable pigmentation of the conjunctiva, but this is quite common in the negroes and mulattoes, and probably antedated the disease. The eye-ground at this time showed nothing abnormal.

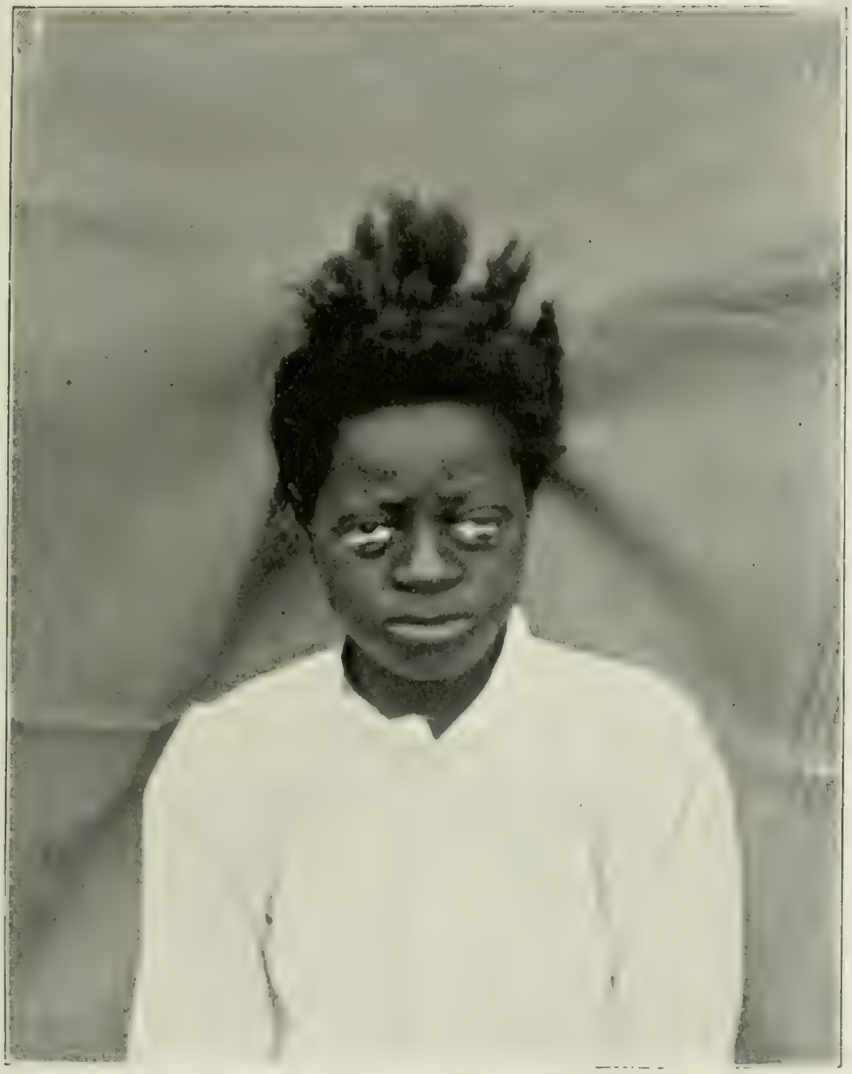
The appended cut illustrates very well the appearance when the patient was on the road to recovery, and was made for me by my friend, Dr. Alfred Moore.

These cases are very rare, and are usually, as was probably the case in this instance, due to a rheumatic diathesis. A few cases are reported in literature, but the clinical history of this case covers most of the points usually noted.

Mazza (*Revue generale d' ophthalmologie*, October 31, 1894) has recorded six cases, in all of which the conjunctival swelling was marked below the cornea. He thinks free incisions are necessary on account of danger to the nerve from pressure by the effusion.

Burnett (*Archives of Ophthalmology*, January, 1894) reported a case in a healthy girl of eleven, accompanied by serous retinitis. Puncture through the lids allowed the escape of some bloody serum and was followed by recovery.

Continental Building.



Dr. E. C. Ellett's Case of Tenonitis.

BILATERAL ABDUCENS PARALYSIS.*

BY WILLIAM A. FISHER, M.D.,

OF CHICAGO,

Professor of Ophthalmology, Chicago Eye, Ear, Nose and Throat College; Attending Surgeon, Illinois Charitable Eye and Ear Infirmary.

Illustrated.

I present a case of bilateral abducens paralysis, not as a common one, but as one of most infrequent occurrence. There is present not only paralysis of both abducens, but as much contraction as is possible, not only of the muscles that turn the eye inward, but of all the ocular tissues toward the nasal side. I would hesitate to present to this society an ordinary case of unilateral abducens paralysis, for you all know how frequently such cases occur. In fact, I am rarely without such a case. At this writing there are three patients in my clinics, all having a specific history. This particular case is given because it shows what a great deformity can follow paralysis of this kind.

Mrs. B., aged fifty, married thirty years. Five children, three living and in good health; one died of measles and one of croup. Father died at the age of seventy; mother died at the age of seventy-five. She has had three brothers; one died in the army in India; has not heard from other two for ten years, when they were in good health. Six sisters; two died in infancy; others in perfect health. Thirty-seven years ago, or when she was thirteen, her left eye began to turn in. Previous to that time she was not aware of having any eye trouble. She consulted a physician in Ireland, and was told her eye could be straightened by an operation. About twenty years ago, or seventeen years after the left eye turned in, her right eye began to turn. Six years ago she had the la grippe, and since that time her eyes have grown rapidly worse. Last two years they have been about as we now find them. The patient has been a hardworking woman all her life, doing washing and carrying heavy baskets of clothes on her head. She is now in, and has always enjoyed, good health. Vision sufficient to enable her to get around where she is well acquainted. Tension normal. The eyes were rotated so far inward that both pupils were hidden in the inner canthi. It was impossible to rotate either eye out under cocain anesthesia. Not being able to get an ophthalmoscopic view, and knowing there could be no harm in an attempt toward straightening, and possibly some good result, the patient was anesthetized with chloroform, and an effort was made to rotate the right eye out, and sever the offending tissues. It was found impossible, however, to rotate the eye outward to any extent, whereupon an attempt was made to sever the internal rectus. Not only was it necessary to sever the muscles that rotate the eye inward, but it amounted to a dissection of all the ocular tissues toward the nasal side. The eye was fixed as firmly as in a case of panophthalmitis, and there were adhesions everywhere. A slight improvement was produced, notwithstanding, which lasted a few days; the pupil was free from the inner canthus, but there was no improvement in vision. Since the operation, contraction has taken place, and the eye is at present in about the same condition I found it. The patient has never complained of pain in the eyes, and gives no history of any inflammatory condition, but we have adhesions which could not have been produced by inflammation without the patient being conscious of it.

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* Read before the Western Ophthalmologic and Otolaryngologic Society, April, 1898.

Hutchinson reports seventeen very interesting cases of ophthalmoplegia externa (*Royal Medical and Chirurgical Society of London*, 1879). In summing up he was certain that syphilis had been the cause in ten of the seventeen cases, and that in the remaining seven a reasonable suspicion of syphilis might be entertained in several. He further held that, with such a fact in mind, it was almost impossible to make the negative even fairly possible. The evidence which connects this affection (ophthalmoplegia externa) with syphilis is exceedingly strong, and the theory that it can occur independently of it must be regarded as open to some doubt.

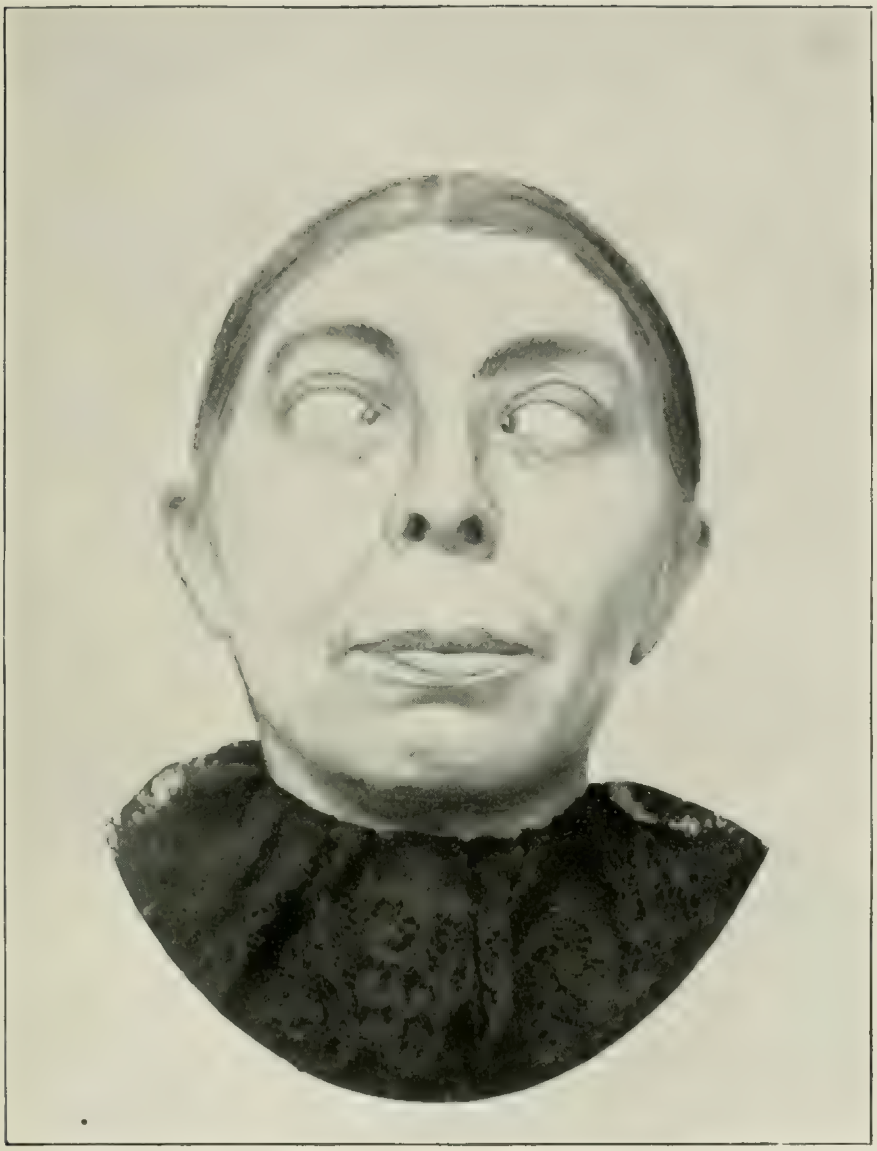
The cause of paralysis in the particular case I have cited, however, is obscure. We can exclude some of the common causes in theorizing and diagnosing, but syphilis should not be excluded, even if we have a negative history, as in this case. As syphilis is given as the cause of nearly all these paralyses, I have given my patient increasing doses of potassium iodide, and will continue the treatment for a reasonable time. It would be no more than fair, in my opinion, to suppose the lesion in this case was caused by la grippe.

THIOSINAMINE—A CLINICAL CONTRIBUTION TO ITS STUDY.

BY GEORGE F. SUKER, M.D.

OF TOLEDO, OHIO.

Recently rather much has been written upon the use of thiosinamine —not so much in this country as abroad. However, so far every article that has appeared in the various journals has been of more interest to our fellow practitioner than to the ophthalmologist. Though several (Tousey & Newton) do make mention of the employment of thiosinamine in aural and ophthalmic practice, yet no extended report of such a study has been noticed in an ophthalmological journal. It is for this



Bilateral Abducens Paralysis.

reason that the writer invites your attention to the question of thiosinamine.

Though thiosinamine has just recently been extensively used, it is by no means a late chemical production. We find an accurate description of it in many works on organic chemistry—Berzelius (1828) and Strecker (1857). Though it is obtained from our every-day common household remedy, mustard-seed oil, yet it never was used in the practice of medicine until in 1892. Hebra was the first to report on its therapeutical application (*vide* Trans. sec. internat. Cong. of Dermat., Vienna, 1892). He experimented with it in lupus and tuberculosis; in the former he achieved good success, while in the latter, none at all. Hebra and Van Horn made a complete physiological, as well as a bacteriological study of it.

From the studies of Hebra, Keitel, Van Hoorn, Richter, and Sedziak, it remained for Tousey of New York to make the discovery of its almost specific action in keloids (*N. Y. Med. Jour.*, May '96, and November, '97). Tousey was the first to note its softening and relaxing influences upon old cicatrices.

When given in doses varying from ½ grain to 3 or 5 grains, once daily, it acts as a mild tonic, stimulates the appetite and increases urination. After the injection of a 15% alcoholic solution (15mm.), a breaking down of the leucocytes takes place and a reduction of one-third results, which lasts for about four hours, followed by a very active increase in number. Richter maintains that as far as its action on the blood is concerned, thiosinamine belongs to the same category of drugs as hamialbumose, sodium urate, urea, tuberculin, pepsin, peptone, and the like. The actual cause of this breaking down of the leucocytes is yet a mooted question.

It is an active diuretic and hastens the absorption of effete material. The excessive diuresis continues only for a few days. Richter thinks this is a therapeutical action, which is discontinued after the abnormal fluids have been eliminated. However, this has not been the writer's experience, though the excessive diuresis ceases after several days; still the quantity of urine remains increased as long as the drug is administered.

The long continued administration of the maximum doses (6 to 10 grs.) will cause nausea, violent headaches, and excessive malaise. No better results are achieved or a more rapid improvement of the patient obtained by prescribing the large doses. However, none of the symptoms that supervene after the administration are in any way detrimental to the patient.

When thiosinamine was first used for the treatment of tubercular affections, it was given hypodermatically in a 15% alcoholic solution. The dose was from ½ to 1 grain twice a week, and gradually increased until 3 grains were given.

DuClaux, of Paris, recommends a 10% solution of equal quantities of water and glycerine as follows: Thiosinamine, 0.5; glycerinæ —; aquæ, aa 25.00.

This given subcutaneously is not nearly as painful as the alcoholic solution. 12 to 18 mm. are given three times a week. This latter solution keeps just as long as the alcoholic one. Nevertheless it is well to keep any solution of it in a dark and well corked bottle.

However, thiosinamine given internally in doses of 3 grains daily is as good as the subcutaneous medication. In giving it by the stomach, care must be taken not to give more than 1 grain a day in divided doses, gradually increasing the same from day to day until 3 grains are taken. The object of this is to avoid any nausea. It has been the writer's experience that if ½ grain is given night and morning for several days and then the dose gradually increased by ¼ grain per day, the disagreeable stomachic symptoms are entirely avoided. It is best given directly after the morning's meal. Never give a dose in the latter half of the day or at bedtime, as it surely will cause the excessive dreaming which is so very annoying. The best method of dispensing thiosinamine is in capsule form. The pill form is not at all desirable.

It seems to be customary to discontinue the administration of thiosinamine after it has been taken for six or eight weeks, for a period of ten to fourteen days. After the lapse of this time, the regular dose of 3 grains is again instituted. The writer has done this in some cases, but the following method, in the majority of cases, seems to give better results. Instead of withdrawing the drug entirely for that period, he gives it in ¼ to ½ grain doses for that period, and then resumes the full dose of 3 grains. So far no idiosyncrasies have been noticed in the patients who have taken thiosinamine.

The following is a clinical report of a number of cases occurring in the writer's experience. The class of cases in which it was employed were: Corneal opacities, catarrhal deafness, and chorioiditis exudativa. It was given in a sufficient number of cases to warrant the statement that thiosinamine is truly worthy of an extensive trial in like cases.

Before entering into the details of the cases, permit the following statement. So far, the two cited cases of chorioiditis exudativa are the first of their kind reported in which thiosinamine has been the only remedy administered. A careful search in the literature upon thiosinamine was made, and no mention of its use in chorioiditis was found.

Mr. H. H., æt. 40 years. Laboring man. Family and personal history good; absolutely no specificity. Ten years ago while blasting met with severe injuries about the head—resulting in the loss of the left eye—extensive cicatricial contraction of the right cheek, in consequence quite a marked ectropion of the lower lid of the right eye (not interfering with the welfare of the eye). Since then he has had a pterygium removed from the right eye. This left a dense leucoma in the cornea—not impinging upon the pupillary area. The leucoma was not even translucent, so dense. In the latter part of 1896, he began to notice a slight failing in the sight of the right eye. This gradually grew worse, so that in about six months he was unable to follow his vocation. He first came under my charge in the latter part of 1897. The following is the condition of the right eye:

O. D. V.=20/200, with a—2.00 cyl. ax. 180°=20/120.

The field of vision is a trifle contracted on account of the leucoma above mentioned. Pupillary reaction normal. Vision a trifle better after sundown. No iridic adhesions were present. The ophthalmoscope revealed a beautiful picture of exudativa choroiditis disseminata. The optic nerve entrance was indistinctly seen, showing evidences of its secondary atrophy, especially on the nasal side. There were distinct evidences of an optic neuritis.

The opacities in the vitreous were somewhat numerous. On the posterior capsule, toward its periphery, were several dense linear opacities extending in an oblique direction. Toward the center of the same capsule there was a cluster of six opaque spots, each individual spot no larger than a pinhead.

In other respects the eye did not differ from the usual picture of choroiditis exudativa. The patient had never taken any treatment for his eye trouble.

He was given 3 grains of thiosinamine as a daily dose, beginning November 1, 1897, and weekly notes of the condition were recorded.

The first change was noticed on November 28, 1897. The patient noticed a decided improvement in vision after sundown, i. e., the outlines of objects were more sharply cut. His vision with a —2.00 cyl. ax. 180° =20/80, while without, 20/120. This, we see, is a decided improvement in so short a time. No other changes were noted.

December 11th, vision equaled 20/80 without any correction, but with a +1.00 ◯ −2.00 cyl. ax. 150° vision equaled 20/60. The leucoma showed evidences of transparency. It originally was a very dense glistening white opacity. Then, too, capsular opacities, instead of giving that intense black hue, were almost transparent. Still, the fundus did not show as much of a change as the capsule and corneal opacity. The outlines of the optic nerve entrance are now distinctly discerned where heretofore it was impossible.

On December 30, 1897, vision equaled 20/60 without any correction, but with the above 20/40. This time the leucoma is considerably smaller, and not so dense. For, through its center one can obtain a faint fundus reflex with the ophthalmoscope. The vitreous opacities are less numerous and not so dense. The linear capsular opacities are completely translucent in the center and their edges transparent. The little cluster is decidedly gray and not black. Retina, choroid and nerve-head present the same appearance as on December 11th. The patient says he can see "remarkably well." The facial cicatrices are decidedly relaxing and the ectropion rapidly disappearing.

February 2, 1898. There is no improvement in the vision. The leucoma is transparent throughout its extent.

February 16, 1898. Vision is 20/40, a trifle minus; with a $+1.00 \bigcirc -2.00$ cyl. ax. $150^\circ = 20/30$, i. e., he can read two or three letters in this line correctly. The nerve-head does not present that atrophic appearance first spoken of. The field of vision is not materially changed. Though the whole fundus is greatly improved, yet the improvement does not correspond with the decided gain in the acuity of vision.

March 3, 1898. The condition has not changed sufficiently to speak definitely since February 16, 1898. The patient is still taking thiosinamine.

In the other case of exudativa chorioiditis the lesion was not so extensive, less reduction in the acuity of vision and no complications. In this case, the vision before treatment equaled 20/80 and was raised from that to 20/40 within four months. No correction required to obtain this acuity. In both cases the exudative period of this disease had not passed off entirely.

Though a goodly share of our chorioiditis cases have a specific history, yet undoubtedly many are due to other causes, such as malnutrition, local ocular disturbances, secondary in their nature, and others—shall we say idiopathic? In the above cases malnutrition is considered the cause.

Though the prognosis of chronic chorioiditis exudativa disseminata is unfavorable on account of the danger of the continuance of the disease, yet the writer sincerely maintains that a great deal may be accomplished if thiosinamine is used in such cases where the exudative stage has not entirely passed away. While the prognosis in the acute variety of the disease is rather favorable as to the outcome, yet relapses are to be feared. Such relapses endanger the patient very materially, and in these acute cases thiosinamine is bound to accomplish more, and that, too, permanent, than any other line of treatment. The thiosinamine is given on account of the fibrous and cicatricial changes which invariably take place in any form of exudative chorioiditis. That this hypothesis is correct can be seen from the results obtained.

The next case is one of corneal opacity:

Mr. M. H., æt. 41 years. Twenty years ago had an attack of chronic trachoma in each eye. The corneæ were not affected at the time. Since the last four or five years has been subject to pinhead ulcers of the corneæ. In the right eye these little ulcers during one attack became confluent and produced a large central corneal ulcer, leaving an extensive opacity. The left eye had several large marginal corneal ulcers. Both corneæ were studded with minute areas of opacity. The trachoma cannot alone be held responsible for the corneal opacities, as he has had trichiasis for a number of years, hence a constant corneal irritation. The trichiasis was nicely removed by operative measures before treatment was begun. The vision, before the treatment with thiosinamine was instituted, was on November 1, 1897, as follows: O. D. V.=20/200, O. S. V.=20/120. No correction of any kind would raise the acuity. However, by placing a stenopæic slit at an angle of 75 degrees in the left eye and 105 degrees in the right, the vision was raised to 20/80 and 20/120, respectively. No lens, in addition to the slit, has any influence upon the acuity. This, however, showed that the patient had irregular astigmatism. He was given three grains of thiosinamine daily. As in the other cases, the patient was given half the dose for a short period.

The state of vision was noted at regular intervals, and found to be slowly but steadily increasing in acuity, so that at the present time, with stenopæic slit: O. D. V.=20/60 O. S. V.=20/40. However, with the addition of a + 2.00 D. sph. in each eye, vision was raised to: O. D. V.=20/40, O. S. V.=20/30 (a trifle plus). But with the naked eye O. D. V.=20/80 +. O. S. V.=20/60 +. At present, the corneæ look nice and clear, only a trifle hazy.

It is to be added that thiosinamine in this case constantly kept up a mild ocular conjunctival vascularization bordering upon inflammation. During the interim of small doses, however, this irritation completely subsided. This finding corresponds with that of Tousey and others whenever the drug is administered during a latent or a mild grade of inflammation. At such times the low inflammatory condition is liable to be fanned into activity.

C. F., æt. 12 years. For two years has had periodical attacks of phlyctenular keratitis and its sequelæ left each cornea remarkably hazy—in fact, an extensive opacity. Every line of treatment was resorted to, to relieve the condition, but of no avail. He has had no relapse, the last attack being in January, 1897.

The vision in the right eye in August, 1897, was 20/120. This was increased with a + 2.00 D. sph. to 20/80. The left eye was amblyopic in consequence of a convergent strabismus (amblyopia exanopsia). He was given thiosinamine as in the other cases, i. e., 3 grains a day. At the present, the vision in the right eye, with the correction, equals 20/40. Both corneæ are much clearer than they ever were. The treatment was begun September, 1897. It was suspected that the thiosinamine might stimulate the latent tendency of the phlyctenular predisposition, yet it has not done so. Though it has been taken regularly since September, and is still taken, no return of the corneal trouble is noticeable.

The following case of corneal opacity does not show so marked an improvement as the former cases:

Mr. C. P., æt. 45 years. Both corneæ were infiltrated and somewhat opaque in consequence of a very virulent attack of chronic trachoma and pannus some fifteen years ago. As a result, the vision in each eye never was any better than 20/200. After taking thiosinamine for some six months, the vision was raised to 20/80. Though the result obtained is not very striking, yet it demonstrates what can be done when everything has failed.

The above four cases are taken from a series of twelve, and fully illustrate the possibilities of success when thiosinamine, and nothing else, is employed in like cases. Though more clinical evidences are required before unreservedly indorsing thiosinamine and incorporating it into our ophthalmic therapy, it is worthy of a fair trial in all cases of corneal opacity, either recent or of long standing. Then, too, the writer wishes to say that, judging from results in chorioiditis exudativa, it is entitled to a thorough trial in similar cases. Knowing, as we do, the sad prognosis that stares this class of patients in the face, it is no more than just that we should give them any benefit we can, even if we have to resort to the new medication herein outlined.

Whether or not it would be of any benefit to combine thiosinamine with potassium iodide in syphilitic chorioiditis remains to be proven by future clinical evidences. It does seem rather reasonable to employ it since its action is similar to that of potassium iodide. The writer is using this combination in several cases and with apparent success.

If further trials substantiate the present observations, and time proves the results obtained as permanent, then we have in thiosinamine a truly valuable remedy. It will, therefore, be of equal service to the general practitioner and ophthalmic surgeon, as well as a boon for many an afflicted patient.

The clinical results which the writer has had in several cases of catarrhal deafness will be reported in another communication elsewhere.

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"*The Monticello.*"

THE TORSIOMETER—AN INSTRUMENT FOR THE STUDY OF THE RETINAL MERIDIANS.

BY EDWARD P. BREWER, M.D., Ph. D.

OF NORWICH, CONN.'

Illustrated.

Operative binocular vision is obtained only when the image is pictured on identical points of the retina. To realize this, not only must the point of fixation be the same, but the meridians must exactly register. The normal position of the so-called "apparent vertical meridians" (Hemholtz) is nearly vertical and always parallel. The methods of determining the position of the meridians have been complex and ill adapted to routine office work. The subject is, however, of great practical bearing, and enters, as an important factor, into the consideration of nearly every case of heterophoria.

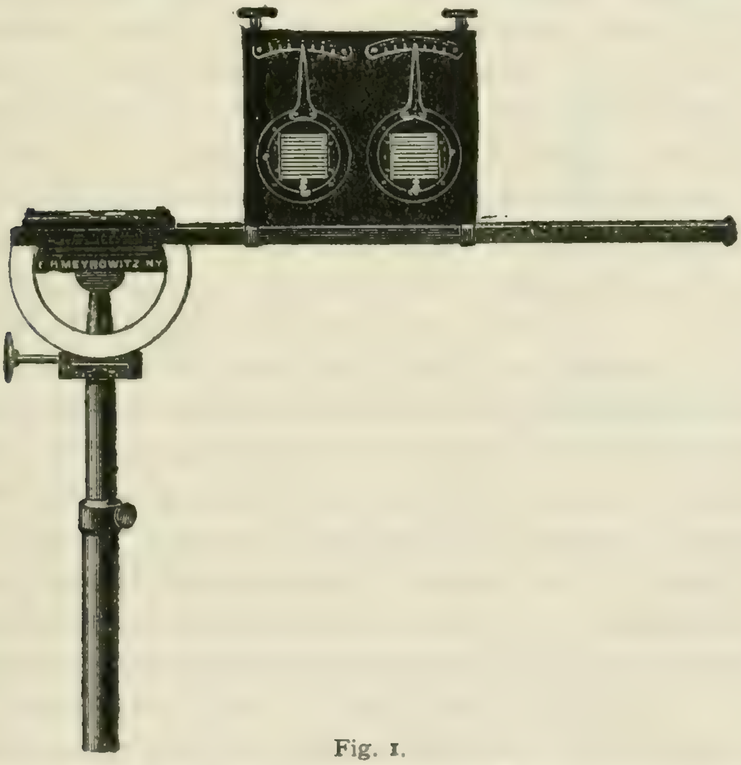

Fig. 1.

After extended observations, I have devised an instrument which, with nearly two years' use, has proven of such value and interest that I have decided to place it before the profession. My instrument—the torsiometer (Fig. 1)—offers a ready and accurate means of determining the positions of the vertical and horizontal meridians while the eye is at rest, and of measuring the torsional power of the eyes.

It consists of a plate containing two groups of Maddox rods mounted on a projecting arm of a tripod stand, the various parts of the stand and arm being adjustable. Each group of rods is secured to a rotating disc, which is moved by an endless screw. Attached to the disc is a pointer registering the rotary movements of the disc. Adopting the excellent nomenclature of Dr. Geo. C. Stevens, the movement of the pointer from the center is termed the *plus* torsion, and toward the center the *minus* torsion. The groups of rods may be rapidly changed from the vertical to the horizontal position without disturbing the pointer, so that when the rods are either exactly vertical or horizontal the pointer is always at O. On the reverse side are clips to hold prisms or other lenses. To measure the position of the apparent vertical meridians while the eyes are at rest, the patient is placed in a room with a candle ten or twenty feet away, as may be more convenient, and with no other source of light *in front* of the patient. If considerable ametropia exists, it should be duly corrected. The torsiometer is placed in front of the patient so that a series of horizontal rods is in front of each eye. The eyes are then dis-associated by placing a nine-degree prism in one of the clips, base inward. Two long upright bands of light are visible to the patient, which are exactly plumb and parallel if the eyes are normal in balance and the pointers are at O. It is well to study the lines separately, attention being first directed to the right line, and if not erect, the thumb-screw moving the rods should be turned in a direction to secure an erect effect. The left line should be likewise adjusted to appear erect. The lines may be then compared and corrected by the intervening space, and any difference in the width of the space top and bottom corrected. If when so adjusted the pointers are at O, the balance is normal, and the apparent vertical meridians will register. If torsion exists, it will be recorded in degrees of arc, on the scale. Control measurements may be made by turning one set of rods to an upright position, thus securing a horizontal bar of light which, in the absence of torsion, is at right angle to the vertical line when the pointers are at O. The methods may be again varied by placing both bars of light in the horizontal position and, after disassociating them by a suitable prism, adjusted each in turn to an exact horizontal position and parallel. In every position the pointer will be at O if the "longitudinal meridians" are parallel, the latter being always at right angle to the apparent vertical meridians.

We may next measure the torsional power of the eyes. For this purpose the rods are turned to a horizontal position and a vertical bar of light secured. No prism is used and the pointers are at O. The thumbscrew of the right disc is revolved to turn the pointer outward, or plus. This movement is continued until the lines slightly separate at the very top—Fig. 2 (which is the case in orthophoria); the motion is then reversed and the lines just united so that a reversal of the motion will throw them apart if it amounts to 1°. The pointer will then record what is called the plus torsion of the right eye, and betrays the limit to follow in concert with its fellow a line moving outward from the center at the top and inward toward the center at the bottom, the direction of the line being upwards and outwards. The right disc is then rotated inward until two lines are seen at the bottom Fig. 3, when the motion must be reversed and a single line secured, the direction of the line being upwards and inward. The greatest rotation compatible with the maintenance of a single line indicates the minus torsional power. Placing the right pointer at O, the left eye may be tested in the same manner. In measuring the right eye the pointer of the left is maintained at O, and in measuring the left the right pointer is at O. Turning the rods to an erect position, the resulting horizontal bar of light may be utilized in the same manner to measure the horizontal torsional power.

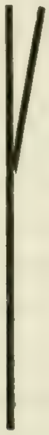

Fig 2.

Fig. 3.

The vertical torsional power varies greatly. The highest torsion yet observed is plus 26°, and minus 10°. In each of the cases there was a general disturbance in the muscular balance. In eyes with inconsiderable errors, refractive or accommodative, I find the plus torsion about 5° and the minus 3°. The horizontal torsion is about 2° plus, and 1° minus. It may be reduced or absent, but it is seldomed increased.

The distance of the source of light is quite immaterial as far as effecting the torsional error, for in thousands of examinations I have never detected the slightest difference in the torsional error, whether measured at one foot, or at twenty feet. It is important, however, to secure a very narrow and distinct bar of light, and unless the Maddox rods are quite small, the source of light must be at a distance. In cases with a material reduction of visual acuity, the distant source of light must be reduced for obvious reasons.

The torsional power as determined for one eye represents the sum of the available binocular torsional power. Quite commonly, the torsional power of one eye is a degree or two more than its fellow, and not infrequently double; yet I have no hesitation in declaring that the real working torsional power is represented by the one measuring the most, and *never* the sum of the plus or minus torsional power. In this respect it resembles the abduction. The evidence warranting this belief will be considered at another time, the scope of this paper not permitting of its discussion. The horizontal torsional power is more stable than the vertical but very limited, and appears to bear no relation to the degree of vertical torsion. Its practical bearing, as far as the study of the vertical torsion is concerned, is of small import; indeed its, very existence is, I believe, entirely accidental. This subject will also be considered at another time.

All muscular errors seriously disturb the torsional power, and some the parallelism of the retinal meridians. In hyperphoria, especially of two or more degrees, the vertical meridians are tilted outward, the direction being upwards and outwards. The degree of the plus torsional defect may be but one or two degrees or seventeen degrees, as I have seen in one case, but in every case, even of only 1° hyperphoria, the minus torsional power is reduced. It is not unusual to find only 1° of minus torsional power, and in scores of cases I have found it entirely absent, the vertical meridians scarcely registering. In most cases there is a marked increase in the plus torsional power, especially if associated with esophoria, but this is not so constant as the reduction in the minus torsion.

In cases of esophoria of 7° or more, the meridional parallelism is commonly disturbed and associated, as far as my observations now go, with plus errors. In simple exophoria the meridional parallelism is less frequently disturbed, and then more frequently upward and inward (minus), but the variation is commonly inconsiderable, seldom exceeding 2°. I have not yet seen a minus vertical error unassociated with exophoria. In cases of hyperexophoria the meridional parallelism may be either minus or plus, generally the latter, for the tendency of all cases of hyperphoria is to plus errors, and its influence may dominate; yet in all cases the minus torsional powers will be well preserved, and may surpass the normal. If more extended study shall establish these observations we have a therapeutic hint of no small value.

THE
OPHTHALMIC RECORD.

A MONTHLY REVIEW OF THE PROGRESS OF OPHTHALMOLOGY.

VOLUME VII. CHICAGO, MAY, 1898. No. 5 NEW SERIES

EDITORIALS.

THE OPHTHALMOLOGIST AND THE OPTICIAN.

The optician of the present aspires to nothing short of a profession. He is not content with the profits of a mercantile life. He must, perforce, be called doctor or professor, according to his preference. It may be, that before long we shall feel, with the English surgeon, that plain Mister carries with it more dignity than the title of Doctor. It would seem that a man may be a doctor of almost anything that suits his fancy. The conferring of the degree is a matter of indifference. Where the average "Doctor of Refraction" acquires his title seems to be obscure. It is often conspicuous after some optician's name. As to the responsibility of these men, we need say nothing. Since they ultimately make work for the oculist, we should, so far as our pockets dictate, encourage them to go ahead. It has always been the aim of the medical profession to promote the welfare of the "dear public," but the "dear public" do not always want their welfare promoted. Especially is this the case when some legislative act is to be passed by us for their protection. To the medical profession is due the credit of improved sanitary conditions. Have we or the public been the gainers? Yet, public health boards experience great difficulty in obtaining adequate appropriations for their maintenance.

The "Doctor of Refraction," with his full right to advertise, is an expense to the public, but the oculist profits by his bad work. It would seem that, in our capacity of public guardian, we should attempt to legislate against this new evil, the "Doctor of Refraction." Would our motive be understood? Is it possible to teach the public that they are being imposed upon? Would they not conclude that the oculist was being pushed to the wall, and in consequence was acting in self-defense? I am afraid it would be called class legislation.

Where the oculist makes a mistake is in the dispensing of glasses. It is not uncommon for a patient to be given a price on a pair of glasses and nothing said about a fee for examination. That is included in the price given. Such work is purely commercial. It even smacks of charlatanism. Why? Because there is a fee collected *sub rosa*. When we stoop to such commercial bartering we cease to practice our profession, and sink to the level of these "Doctors of Refraction" who have no legal right to collect a fee. By so doing we openly confess that the "Doctor of Refraction," the traveling vender of glasses, and the quack optician are getting the better of us. We confess that we do not deem our services of sufficient worth to collect a fee. If the oculist is so grasping as to desire to add to his fee for examination the additional profit of the glasses, let him do it openly, so that his patient will understand that he has paid for professional services as well as for the glasses. We realize that many small cities do not have an optician, hence the oculist must send for and furnish his patients with glasses. Where this is necessary, let us conduct the transaction in a professional manner.

The optician complains that he is compelled to fit glasses because the oculist does not send him his prescriptions. On the other hand, the oculist insists that the only way to get even with the optician is to furnish the glasses and make the profit himself. It would seem that we are coming to be "opticio-oculists" and "oculo-opticians." Who is getting the worse of this unseemly war, the optician or the oculist? Who has the more to lose? We lower our dignity;, they elevate theirs. Let us hope that commercial instincts will remain subservient to professional pride, and that in the end the oculist will still be a physician, and the optician be the same to him as his druggist. G. M. B.

REPORTS OF SOCIETIES.

SECTION ON OPHTHALMOLOGY.

COLLEGE OF PHYSICIANS OF PHILADELPHIA.

Meeting March 15, 1898. George C. Harlan, Chairman, in the chair.

G. C. Harlan's second case of *kerato-globus*, a sister of the case shown at the February meeting, presented many features similar to it: globular distention and perfect transparency of both corneae; deep anterior chambers; oscillating irides; lenses present; hyperopia of 5 D. and no cupping of disks. The horizontal diameter of each cornea is 14mm., and of each ball at the equator, 24mm.; the pupils are only 1mm., and under atropin 2½mm. During the past two months the vision has been failing, and the fields are decidedly limited. The optic disks, examined with difficulty on account of the small pupils, appear dull and gray, and the retinal veins engorged. The lowered vision is accounted for by the condition of the nerves, and is independent of the kerato-globus. The parents and three children of the patient have no unusual ocular condition. The occurrence of this anomaly in two members of a family confirms the view of its congenital origin.

Discussion.—Edward Jackson found the curvature of the corneae to be uniform almost to the scleral junction, and that the lenses were present, but displaced slightly downward.

W. F. Norris believed the R. lens was present, but in the left eye its presence was doubtful. The patient was probably suffering from progressive optic neuritis.

Edward Jackson showed a case of *Anomaly of the Iris.* The man, aged 69, had good sight until 9 years before, when he had severe pain in the right eye and whole right side of the head. This eye now presents high irregular astigmatism and a pale optic disk; Vn. $\frac{2}{40}$.

The left eye had continued good until four years ago, when vision became impaired without pain or inflammation. There was a macula of the outer portion of the cornea; some opacity of the lens; and the iris, at its upper, inner portion, exhibited a small area entirely devoid of pigment, through which the fundus reflex was obtained. In this direction, also, there was an entire absence of the sphincter of the pupil. Other portions of the pupillary margin reacted to light, but this remained fixed. The pupil and iris of the right eye were normal. Patient denied all history of injury or imflammation in the left eye, and was positive this had remained good after the right eye had been impaired.

Charles L. Leonard by invitation exhibited and described his apparatus designed for the localization of foreign bodies within the cranium and orbit. It consists of a yoke that can be firmly fastened to the patient's shoulders; adjustable upon this yoke is an upright frame which supports the plates, and to which the patient's head is firmly fastened by bands during the entire series of observations. Rigidly connected with this, but adjustable at any angle, in a plane perpendicular to the photographic plates, is an arm which carries the X-ray tube. The relational angle can always be read from a divided arc, situated at the articulation.

The apices of these angles are marked upon the skin, and shown upon the photographic plates by two lead ferrules, which are always placed upon the margins of the plates, and do not, therefore, cast their shadows in the field of observation. They slide upon an aluminum wire permanently placed upon the upright frame.

The tube, foreign body and plates are, therefore, held in a known, rigid relation to each other and the known point, while a series of observations is made, which give the data from which their mutual relation may be mathematically determined, or may be accurately measured by the graphic method.

The sources of error common to other methods, but avoided by this rigid apparatus fixed to the patient are: Changes in the relation of the tube, foreign body, known point, and plates by unconscious motion of the patient or during the interchange of plates. An additional advantage is the absence of all foreign bodies from the field of observation.

The X-ray "burn" is not due to the X-ray, but to the static electric charge induced in the tissues of the patient by the high potential induction field surrounding the tube. It is never serious, and may be prevented by introducing a "grounded" aluminum conductor as a shield between the tube and the patient.

Howard F. Hansell reported a case of diagnosis of the presence of a piece of steel in the left eye by the X-rays, and its localization by the method of Wm. M. Sweet. It was extracted from its site under the lower periphery of the lens after iridectomy, by the medium-sized curved tip of the Hirschberg magnet. It weighed 9.5 mg. and measured $4 \mathrm{x} 2 \mathrm{x} \frac{9}{10}$ mm.

The eye recovered perfectly from the injury, although vision is reduced to the perception of large objects on account of blood in the vitreous chamber. The X-ray plates, so valuable in the treatment of the injury, unexpectedly revealed the presence of another fragment of steel in the orbit near the external outer angle, of which no history whatever could be obtained. The only plausible explanation of its presence was that it entered cotemporaneously with the other injury. Against this supposition, however, is the absence of any external wound, of hemorrhage, of bruise or contusion of the tissues, and that the second fragment was found after removal to consist of steel of a different character and quality from those of the other. Its localization was forcibly demonstrated by the response to the magnet, which, when passed over the skin in its immediate neighborhood, was invariably puckered and elevated. With the aid of the magnet it was easily excised, and its dimensions were found to be 6x1x¼ mm. and its weight 23.5 mg.

Wm. M. Sweet reported, by invitation, the results of his experience in the localization of foreign bodies in the eyeball by his apparatus. The various methods that have been employed resolve themselves into a determination of the angle of the X-ray tube with the foreign body and with one or more dense objects situated near the eyeball. Approximate results have been obtained from the study of the shadow of the foreign body in relation to the shadows of the orbital bones; but owing to the variations in the position of the eyeball, which have been shown by the investigations of Cohen to amount in healthy individuals to as much as 10 mm. behind the edge of the orbit and 12 mm. in front of the same, this method does not equal the accuracy possible by other means. Whatever form of indicating object is used in working out the position of the foreign body, certain factors are essential to accurate results: 1. A tube should be used which may be run at high vacuum, in order that the rays readily penetrate the bones of the head. 2. The patient should be in the recumbent posture to insure steadiness of the head and body. 3. The visual axis should be parallel with the plane of the plate at the side of the head, or, if it deviates, the angle should be measured and allowed for in the determinations. 4. The situation of the indicating objects with respect to the center of the cornea in each individual case should be known, otherwise the determination of the location of the foreign body will vary with the varying situation of the eyeball in the orbit in different persons. 5. The angle of the tube with the indicating objects must be accurately measured. The two indicators being parallel with each other and with the plate, the distance the shadow of one of the balls is posterior to that of the other is the measure of the distance that the source of the X-rays is carried to the front.

The method has been employed in a number of cases of suspected foreign bodies in the eyeball and orbit, in seven of which the shadows of the bodies were obtained on the plate, and their position indicated. Three of the cases were gunshot injuries, in which the findings were not verified by subsequent operation. One case was sent to me by Dr. de Schweinitz, one shot being located in the left eye, and one in the right orbit outside of the eyeball. Two cases of gunshot injury were skiagraphed for Dr. Hansell, in one of which the shot was located at the apex of the orbit, and in the other patient the position of several shot was indicated, one in the eyeball, one in the orbit beneath the superior orbital ridge, and one in each nasal cavity. Recently I made several radiographs of a patient for Dr. de Schweinitz, in which the piece of metal was located in the lower nasal portion of the sclera. Certain clinical signs appeared to indicate the determination made as correct.

The accuracy of the method of localization has been clearly shown in the patient of Dr. Wm. Thomson, previously reported, and in the patient of Dr. Hansell, shown this evening.

An apparatus to accommodate a larger plate has been constructed upon the same principle, which may be employed for locating foreign substances in the head or any other part of the body.

Discussion.—A. W. Goodspeed wrote: "In my opinion, the simplest and most effective way to avoid X-ray burns is to employ an apparatus powerful enough to admit the tube being placed from 18 to 30 inches from the plate with an exposure far within the limits of danger, say not over 10 minutes as a maximum. I prefer a slow-running break also. My experience is certainly consistent with these views."

G. E. de Schweinitz detailed a case of a piece of *Steel Imbedded in the Sclera* for 2½ years, localized by Roentgen's rays according to Sweet's method. In November, 1895, a piece of steel entered the eye probably near the corneal margin at the inner side. In March, 1896, a radiograph of the eye indicated that a foreign body was located in the orbit at the upper nasal side. It was deemed inexpedient to make search for it. In February, 1898, when Dr. de Schweinitz first saw the case, V.$\frac{6}{20}$; eye quiet; marks of a previous iritis; capsule and lens partly opaque; floating opacities in the vitreous. With undilated pupil no foreign body could be detected in the vitreous or in the coats of the eye. A series of skiagraphs taken by W. M. Sweet located it 11 mm. below the center of the cornea, 3 mm. to the nasal side, and 10 mm. back of the cornea. A second series taken while the eye was rotated as far as possible downward, shows a movement of the body practically equal to the extent of the rotation of the eyeball downward. This would seem to determine the sclera as the site of the body. With wide pupil dilatation, a small patch of choroidal atrophy streaked with pigment, and with a black center exactly in the position indicated by the radiographs could be seen. Just over this location the sclera was sensitive to the touch of the probe. The field of vision was markedly contracted, and there was uncertain limitation opposite to where the body was supposed to lie. The patient refused to permit an exploratory operation.

A. G. Thomson has had frequent opportunities of studying Dr. Sweet's method, and had found it precise and practical. In reference to the burns from X-rays, he believed that the practical advantages gained by the X-rays far outweighed the deleterious effects produced by them. After making this statement before the Association of R. R. Surgeons in Chicago, October, 1897, it was stated that six suits for malpractice were pending in the Chicago courts as a result of injuries sustained by the X-rays. In two cases an ear had sloughed away, and in one an eye had been lost. Therefore, it was the custom to use the X-ray only on the patient's own responsibility.

C. L. Leonard replied, in answer to several questions by Wm. Thomson as to the details of his instrument, that it had been devised for the localization of foreign bodies anywhere in the head, including the orbit; and, although it had demonstrated in a number of cases the site of the foreign bodies in the eyeball with great accuracy, none of these cases had, as yet, been operated upon, as the results of removal upon the improvement of vision had not sufficiently demonstrated the value of this procedure to induce the surgeons in charge to operate, and none of the cases had required enucleation.

The exposure employed was from five to ten minutes, with the tube at a distance of eighteen to twenty inches. He preferred this distance, because the relation of any error, produced by unconscious movement of the eyeball, to these greater factors in the calculation was almost without effect upon the final result; while in methods in which the calculations were based entirely on shorter measurements, with the fixed point on the eyeball, not only the foreign body, but also the fixed point, would be moved, doubling the amount of error made, while the short distance of the measurements made the error produce a greater effect upon the final result. He followed numerous other observers in preferring to keep the patient's eyes closed during the observation, the visual axis being readily determined by observing the prominence of the cornea through the closed eyelid.

W. M. Sweet, while acknowledging the possibility of error from movements of the eyeball during the exposure, stated that he had found no difficulty in having the patient steadily fix an object during the short time now required in making the radiographs. With the eyelids closed, as suggested by Dr. Leonard, there was no means of determining the visual axis, an important factor in accurate work. It is not alone necessary to state the distance the body is from a fixed point at the side of the head. The surgeon, to successfully remove the body, must know the relation which this spot bears to the structures of the eyeball. A body located a certain distance from a fixed point of the apparatus might be inside the globe in adduction, and outside in the orbit in abduction. There must exist a factor of uncertainty in any determination of the position of a foreign body in the eye, that fails to take into account the axis of the globe with the photographic plate and the indicating objects, and also the varying position of the eyeball in different individuals with respect to the external orbital angle.

Howard F. Hansell,
Clerk of Section.

MEDICAL ASSOCIATION OF NURNBERG.

Meeting February 2, 1898.

Translated and abstracted from Die Ophthalmoscopische Klinik, March 5, 1898.

BY H. V. WÜRDEMANN, M.D.
OF MILWAUKEE, WIS.

Bergmann. Exudation into the Ciliary Body after Injury. Showed a case from v. Forster's ophthalmic institute, in which the sclera and ciliary body of the right eye had been perforated by a splinter of steel. The wound was at the junction of the cornea, and sclera and both aqueous and vitreous were lost. On the third day after the injury, by illumination, there could be seen a new formation of the size of a bean, which had a silvery shining surface, proceeding from the ciliary body and the wound. This prominence, without any other ophthalmoscopic changes in the course of ten weeks, was half absorbed and without the occurrence of vitreous opacities or inflammatory symptoms. The tension was reduced for a week, and then became normal. The visual field for white and color was physiologic. The visual acuity, after correction, was 5/x. For the differential diagnosis of such pathologic changes, he shows that the clinical course allows us to differentiate with certainty: 1. Purely reactive exudation from foreign bodies which proceed from outwards into the wound. 2. Tumors. 3. True or false cysts. 4. Exudation without membranous coverings. The clinical picture is that of an active displacement from its base of the pars ciliaris retinæ, which is an exudate from the ciliary body under its epithelial covering, whose protracted course is furthered through the free end of a ciliary process, being included within the exudate.

WÜRZBURGER MEDICO-PHYSICAL SOCIETY.

Meeting February 10, 1898.

Translated and abstracted from Die Ophthalmologische Klinik, March 5, 1898.

BY H. V. WÜRDEMANN, M.D.
OF MILWAUKEE, WIS.

Bach. Upon the Ciliary Ganglion and the Center for the Pupillary Reaction. The author gave a short critical review of the previous experiments upon the nature and function of the ciliary ganglion. From these and from his own experiments upon the normal ganglions of cats, monkeys and rabbits, and from experimental results after exenteration of the bulb with more or less complete destruction of the sensory nerves of the cornea, he concluded that the ciliary ganglion is a sympathetic structure. The author spoke further concerning the results of researches upon the location of the reflex center of the pupil. He had decapitated monkeys, cats and albinotic rabbits, and concluded that after an ordinary decapitation, even when done pretty high up, direct as well as indirect pupillary reaction remains. By this there is always left a cervical portion of the spinal cord. If this portion be destroyed with a knife immediately after the decapitation, then the pupillary reaction is lost. From this experiment he concludes that the reflex center of the pupil is in the upper part of the cervical portion of the spinal cord.

Wolff said that in the case of a paralytic there were objective symptoms of pupillary paralysis; the posterior columns of the spinal cord as low down as the third or fourth cervical vertebra were found to be destroyed. This patient died of a carcinoma, which had affected the lower part of the spinal cord. In examination of a number of cases of paralysis and tabes, W. found that where there was pupillary paralysis there were changes of the cervical portion of the cord, and that where there was no pupillary paralysis no changes were found in this part.

WESTERN OPHTHALMOLOGIC AND OTO-LARYNGOLOGIC ASSOCIATION.

Abstract of the proceedings of the Third Annual Meeting, held in Chicago, April 7 and 8, 1898.

The association met in the rooms of the Chicago Medical Society, and was called to order by the First Vice-President, Dr. J. E. Colburn, of Chicago, who introduced Dr. F. Henrotin, President of the *Chicago Medical Society.* Dr. Henrotin welcomed the association on behalf of that society and local profession. He spoke of the necessity for modern specialists, and said that all recognized their value. He believed in societies and organizations. While there might be injustice done here and there, such societies should live and thrive and multiply.

Dr. A. Alt, of St. Louis, responded to the Address of Welcome. He thanked Dr. Henrotin, in behalf of the association, most heartily for the very kind words with which he had welcomed the members on the occasion of their third yearly meeting.

The President of the association, Dr. B. E. Fryer, of Kansas City, was then presented, and delivered a brief address.

Dr. H. Knapp, of New York City, was then introduced, and delivered a very interesting and instructive address, entitled *The Radical Tympano-Mastoid Operation.*

Dr. Hugh T. Patrick, of Chicago, followed with an Address by Invitation, in which he dwelt upon the kinship of neurology, ophthalmology, otology, laryngology, and rhinology.

Dr. Adolph Alt, of St. Louis, Mo., read a paper entitled *Recent Researches into the Histo-pathology of Trachoma.* The author's researches in this direction date as far back as 1876, when he inoculated rabbits' eyes with trachoma. He was perfectly successful in producing a disease which apparently differed in no way from the real trachoma. However, this disappeared again in the course of from one to two weeks. He had some of the old specimens still, and what he had succeeded in producing in the rabbit's conjunctiva differs histologically in no way from the disease in the human conjunctiva. Leber has had the same experience. After a lapse of years the author again took up the study of this subject.

He has collected a considerable amount of material by excising trachoma granules and cutting them into sections. The sections had been studied without the finer staining methods of more modern times, and the conclusions arrived at were that the trachoma granule must be looked upon as a miliary lymphoma of the conjunctiva.

About a year ago, being made some what familiar with the modern methods of blood examination by differential staining by Dr. L. Bremer, it occurred to the author that the smearing out the fresh trachoma granules might be done in a similar way, and enable him to gain more information than was to be obtained from examining sections of the hardened material. The method, indeed, offers immense advantages over any other. He had, in the course of about a year, squeezed out every trachoma granule and many follicles in follicular conjunctivitis which came under his observation, whether they lay superficially or, as in old cases, buried in the depth of the tissue. This fresh material was smeared out between two slides, and allowed to dry in the air. Some of these slides were then stained without any further procedure. Some were hardened in formol, some in alcohol, some in alcohol and ether, some in boiling alcohol and ether, and another larger series were heated to from 120° to 140°, after the method of Ehrlich; most of them were simply drawn a few times through an alcohol flame before staining. The results did not seem to be materially altered by these different methods. As staining materials he had used a great variety of aniline dyes, hematoxylin and eosin. The best staining was obtained by the differential stains composed of several colors. When following up these curious deeply-stained cell-forms and searching for their origin, he came upon an immense cell with a large, pale nucleus, in the protoplasm of which were embedded smaller and larger bodies, which were in part very deeply stained. While these bodies seemed sometimes to simply lie embedded in the granular protoplasma of such a cell, in others they were surrounded by a clear space. In other similar cells clear spaces seemed to indicate where such bodies had formerly been enclosed. Since his attention was first drawn to these peculiar cells, he had never missed them, and he was satisfied that they were more frequent in recent than in older granules. While they are in some specimens rarer, in others they are extremely numerous. The bodies embedded in these cells appear with some stains like round bodies with a piece eaten out, while with other stains it becomes clear that they are mostly spherical, or nearly so, but that only a smaller or larger portion of them, which is sometimes semilunar or band-like in shape, sometimes round like a nucleus, takes on a deep stain, while the remainder is much more lightly colored. Sometimes there are but a few such bodies in such a cell, sometimes their number is so great as to make it impossible to count them. Frequently larger deeply-stained round bodies are seen lying close to this large cell, and by their whole appearance give the impression that they are just such bodies which have grown larger, and are in the act of leaving or have left their former abode. Sometimes he has found only a mass of such bodies lying together near a very pale, large nucleus; the protoplasma enclosing them had evidently disappeared. The more he studied these bodies, the more he was impressed with the fact that they must play an important rôle in the histology of trachoma. The more he searched for them and their derivatives between the other round cells of the granule, the more cellular forms he found, which he thought were such bodies enlarged, and believed that the cells with the small amount of protoplasma lying only at the pole, mentioned before, are the oldest forms of these bodies. It is not at all unlikely that in these bodies we may have to deal with an organism which is the cause of the trachoma granule. That they play an important rôle in its formation, he thinks cannot be doubted. They are the trachoma parasite. Contrary to other observers, he has never seen any reticulum, nor any connective tissue fibers or cells between the round cells of which the granule is composed. Another strange fact is, that although he has a number of injected specimens, which show that the trachoma granules are pervaded by numerous blood-vessels, and although he has in many a fresh specimen, put on the slide without any pressure, seen undoubted channels filled with blood—in none of these smear specimens has he come across any tissue which could be claimed as that of blood-vessel walls. Yet every specimen contains many erythorcytes. It is, therefore, probable that, as it is known to be the case in sarcomata, the blood in the granules is not contained in distinct blood-vessel walls, but rather circulates in clefts in the tissue without other walls than the cells of the granule themselves. Notwithstanding all clinical difference between the so-called follicular conjunctivitis and trachoma, all that he had described in the foregoing applies as well to follicular conjunctivitis as to trachoma. Particularly the bodies which he considered to be parasites, he has always found in follicular conjunctivitis.

Discussion.—Dr. H. Gifford, of Omaha, like many others, had been possessed with the idea that trachoma must be caused by some animal microbe, since the best bacteriologists who had investigated the disease have found no bacteria to account for it. He started a search for the trachoma plasmodium, and for some time thought he had found it, but afterwards found that the same microscopical pictures could be obtained from the mildest cases of follicular conjunctivitis. He has not gone deeply into the mystery of trachoma, and can add nothing to Dr. Alt's admirable description. That the same structural conditions should be found in trachoma and follicular conjunctivitis is not surprising. In other parts of the body the irritation produced by the most various sorts of bacteria results in practically identical histological changes.

Dr. Alt (closing the discussion).—There is very little more to say on this subject. Of course, it is utterly impossible, under our present conditions, to prove the particular parasite that causes trachoma. He thinks, from the enormous frequency with which it is found, that it is of more importance as a causative factor than has been known heretofore. With reference to the infectiousness of trachoma, he does not see how anybody of large experience can doubt it, although he knows there are some practitioners who do deny it. At the Heidelberg ophthalmological meeting a prominent oculist stated that so-called non-infectious follicular conjunctivitis was after all an infectious disease, for the reason that he had infected himself, and at the end of seven months he was not entirely rid of it. This gentleman infected himself to find out whether the disease was really infectious or not. The inoculation of rabbits with trachoma does not help us materially, because, while we may produce the disease in these animals, it does not last. This brings me to the consideration of another point. Dr. Burnett and a number of other gentlemen have at length dwelt upon the fact that the eyes of the negro are immune to trachoma. Dr. Alt thinks this immunity is due to the negro having a greater lachrymal glandular tendency, and consequently the tears flow in larger quantity than in white people. The secretions of the body are antiparasitic, and the tears in coming from the conjunctival sac being free from the ravages of bacteria, may be one explanation why the negro is so much more immune from infection with this particular parasite.

Dr. James Moores Ball, of St. Louis, reported a case of *Quinine Blindness.* (An abstract of this paper could not be procured from the author.)

Dr. A. Alt, of St. Louis, wished to hear some of the members say something with regard to the final outcome of these cases of quinine amblyopia. He knew of one case that was cured by treatment, and a year afterwards the field was reduced to two small patches in either eye. It is quite apparent, if this case was looked upon as a cure, that the disease leads to atrophy, which later on spreads, and ruins most of the conductive apparatus. Some of the gentlemen may have had such cases and been able to follow them up.

Dr. H. Knapp, of New York, recalled two cases that he saw two or three years after the patients were first seen, or after restoration, and vision had remained the same; if anything, it was better. They were young and the atrophy was not of very high degree, nevertheless it was a true picture of quinine amblyopia.

Dr. H. Gifford, of Omaha, happened to have had an experience of this kind in a young lady of nineteen, who came to him and presented a typical picture of atrophy of the optic nerve and concentric limited field. She gave a history of quinine poisoning. About fourteen years before she had taken a large amount of quinine. For some time after she was nearly blind, but Dr. Gifford did not see her. She gradually improved, the sight becoming stationary. It was between ten and fifteen years after taking the quinine that Dr. Gifford saw her. He found the fields contracted about 30° concentric, and vision was 20/40 in each eye. The optic nerves were remarkably atrophic.

Dr. B. E. Fryer, of Kansas City, said his experience was limited to one case which he saw shortly after dimness of vision began, the patient suffering from malaria. He watched that case a little over a year and there was no color blindness. The fields in both eyes, as well as visual acuity, were normal. Dr. Fryer thinks that if the dimness of vision is not treated at once, and if the quinine has been used for any length of time, there is more or less interference with vision.

Dr. A. C. Corr, of Carlinville, Ill., has given a great deal of quinine. For years he did general practice in a district where there was much malaria and gave quinine in large doses, and to find cases of amaurosis growing out of the administration of quinine in large doses is astonishing. When patients had what was called a congestive chill, quinine was administered in various ways, injected into the rectum and used in solution and powders. Dr. Corr thought it a question whether some of these cases of amaurosis are not a mere coincident in the administration of any drug. He has never known patients to complain of their eyes after taking quinine, and has given a great deal of it.

Dr. A. Alt, of St. Louis, while a medical student in Heidelberg, remembered seeing very large doses given in cases of typhoid fever, and the patients were not seriously affected by it. Because quinine is given in large doses in a great many cases and no serious results are produced, does not prove that it is impossible to have them following its use.

Dr. B. E. Fryer, of Kansas City, read a paper on *The Antiseptic Prepa-*

ration of the Conjunctiva for Cutting Operations of the Eyeball. He said the terms antisepsis and asepsis were rather carelessly interchanged by many practitioners, and this ought not to be. He insisted that in many instances surgeons did not, nor could not, make a surface aseptic if they strictly included in the word asepsis not only the absence of septic material, but also the absence of the cause of sepsis, namely, pathogenic bacteria. He then showed how and why this was true. In antiseptic work on the conjunctiva, only very weak solutions of sublimate or of iodide of mercury could be used. He maintained that a mercuric chloride solution in the proportion of 1-6000 could be instilled in the conjunctival sac every day for weeks without any reaction being produced. The method of preparing the eye for a cutting operation upon it, which he employed, is as follows: The face is thoroughly cleansed with soap and water, and then the orbital region is washed carefully with a carbolic acid solution 1-50. The eyelids and eyelashes at their roots are especially cleansed. The conjunctival sac is flushed carefully with 1-6000 sublimate solution, and a bichloride gauze pad is put over and retained upon the eyelid, and it should extend over the brow and nose and down upon the temple and cheek. The dressing is changed daily, and daily the eyelids, brows and cheek are washed with carbolic acid solution, and the gauze renewed. Latterly, in the beginning of the antiseptic preparation the speaker had instilled protargol solution, one per cent., say for four or five days, and at the end of that time dropped in the mercuric chloride solution. He finds in certain cases, especially in those patients who, from having prostatic trouble, and who void more or less pus with the urine, are very liable to infect the eye or have infected it. In such cases the protargol seems to stop the pus flow from the conjunctival sac readily, and also removes the conjunctival congestion. These prostatic cases require greater care in preparation for eye operations than is usually given them, even by those who believe in correct antisepsis. Many of the cases having pus cocci enter the conjunctiva, which cocci, while they have only an innocent surface lodgment, will there produce purulent destruction of the eye if admitted unrestrained onto the globe. By prolonged preparation and following the method he had outlined, he thought oculists could restrain the pathogenic microbes in the conjunctiva as they are restrained in the derma, and sufficiently long to allow of healing before the restraint is removed by the germicides' final removal or elimination. He had microscopically demonstrated streptococci from the conjunctiva of eyes which were to be operated on, and which streptococci were so attenuated in power by the continued antiseptic preparation that no bad result followed the operation. Of course, the condition of the nares must be looked after, and he had found that a weak solution of tincture of iodine in albolene used as a spray did effective work in attenuating microbes in the nasal cavities.

Discussion.—Dr. C. D. Wescott, of Chicago, secures ideal healing, after cataract and other operations upon the eye, without the use of any germicide whatever. Dr. Wescott's operations are almost all done in a private operating room, where nobody else operates. Many of his patients who present themselves for cataract and similar operations come in from the country, and, wishing to go home as soon as possible, are frequently operated upon the day following their admission to hospital. The patient takes a general bath, and the head is thoroughly scrubbed the night before the operation. Then, half an hour previous to the operation, the face is scrubbed with soap and water; and immediately before, either cocaine or holocain is instilled into the eye. Dr. Wescott, personally, scrubs the lids, the brows, and lashes with a warm solution of boric acid. The nurse has previously done the same thing with soap and water. He then flushes the conjunctival sac with a warm solution of boric acid, using Dr. Grüning's fountain vessel, from which can be poured a small stream. He does not believe that boric acid is anything more than an inhibitory antiseptic, if it is that. Frequently the eye is dressed after the cataract operation every two days only, and on the sixth or eighth day the bandage is discarded. Frequently the case goes through what is called hyperemia; but it is a congestion which is not disagreeable, and very often the lids are not gummed together if the dressing is made every two days. Where there has been, before operation, any slight congestion of the conjunctival sac, Dr. Wescott is in favor of applying a dressing each day, and using a little sterilized vaseline to prevent gumming of the lids. As a dressing, two or three layers of borated gauze are applied against the lids, and over that borated cotton and a mosquito-bar bandage. At times he has regretted the use of bichloride solutions even in the strength of 1 to 6,000, because the conjunctiva has been irritated by it; that is, the conjunctiva would be red, and there would be gumming up of the lids on the following day, which does not occur when the simpler methods are used.

Dr. Knapp, of New York: Dr. Wescott speaks in general terms that he is satisfied with his results. He gives us no statistics. It would be interesting to know how many cases of suppuration he has had, if any, and under what conditions.

Dr. W. L. Dayton, of Lincoln, Neb.: The question asked by Dr.

Knapp is very pertinent, and reminds him that in the only case of cutting operation on the eyeball that he remembered of having had that suppurated, was when he used a 1 to 10,000 bichloride solution. Like Dr. Wescott, he relied almost solely upon the warm boric acid solution, and cannot recall now, of the cutting operations made for the extraction of cataract, iridectomies, and other operations, of ever having had suppuration of the eyeball. He does not remember of having had a single case of suppuration or panophthalmitis following a cutting operation under his method of rigid asepsis. Dr. Dayton follows the usual procedure in these cases of cleansing the face, brows, and eyelashes thoroughly before irrigating the conjunctival sac. In cases of conjunctivitis, or of any trouble with the sac, he uses a bichloride solution, but in office work and in the hospital relies entirely upon boric acid. Formalin has been tried, but its action has not been satisfactory. In all cutting operations upon the eye, a bandage is used in the place of isinglass or plaster strips, or anything of that kind. Whether boric acid solution is a bactericide is a question. So long as results are good, Dr. Dayton does not care to find any better solution for preparation in eye cases.

Dr. A. Alt, of St. Louis: While agreeing with what Dr. Fryer has stated in his paper, and while always using bichloride solution, 1 in 5,000, or 1 in 6,000, started with 1 in 5,000, then came to use 1 in 10,000, and is still satisfied with it. He has had two cases of suppuration following cataract extraction, in which bichloride solution was used in the strength of 1 in 5,000. Both of these cases occurred in hospital practice, where everything seemed extremely favorable. One of them was an old physician. Instruments and bandages were thoroughly sterilized. Dr. Alt, the nurse, the bed, and the room were all thoroughly sterilized, and yet suppuration took place. He then became convinced that on account of the extreme age of the patient the caustic effect of the bichloride in this strength was probably too much, and caused necrosis of the tissue. After that bichloride was never used in that strength, and a case of suppuration has not occurred since in his practice. In spite of all our antiseptics, or chemical agents, there may be cases of suppuration. In spite of the washing of instruments and rendering them thoroughly sterile, suppuration sometimes takes place; infection forms in the conjunctival sac, and bacteria from the nasal passages cannot be guarded against.

Dr. Alt would like to know whether any of the gentlemen are acquainted with, or have tried, the method of operating on cataract and in the after-treatment applying no bandage whatever. Papers have been published recently, one by a Scandinavian, in which series of cases are reported, and patients after cataract operations have had no bandages applied whatever. In these cases it is stated that healing was natural and as kindly as had ever been seen. No suppuration followed, but there has been prolapse in one or two instances. The other practitioner is an oculist in Darmstadt, Germany, who published a series of sixty cases, in which he had the same results, but he applied a wire gauze mask over the eyes, with no bandage over the mask. He reasons in this way, that the natural flow of tears is an excellent bactericidal remedy, and that by not closing the lids and allowing them to remove the tears, it is a more efficient safeguard against any infection taking place than we can ever have by excluding air and restraining the flow of tears by means of a bandage. If that is the case, maybe all of our antiseptic ideals will fall to the ground.

Dr. James Moores Ball believed one source of infection in cataract operations is the condition of the sweat glands. He is led to this view by an unfortunate case that he had last summer, where, after taking all the usual precautions, the forehead became infected, and for several days following the day on which the operation was done, the weather was extremely warm and the patient was perspiring freely. He would like to ask some of the older members of the association if they make it a practice to operate on cataracts in hot weather, or whether they consider the condition of the temperature. In this case the usual precautions were taken. Everything was boiled, the patient thoroughly scrubbed, and the conjunctiva washed with a 1 to 4,000 bichloride solution. There was no nasal trouble and no trouble with the lachrymal apparatus, and the source of infection is unknown unless it came from the sweat glands. In male patients, whenever they will submit to it, the eyebrows are shaved in order that the parts may be thoroughly scrubbed. You cannot remove the cilia, but it would be a good thing if we could do so. Certainly, in many instances it is a difficult matter to clean the eyebrows without shaving them, then the skin can usually be cleaned.

Dr. Alt, in answer to Dr. Ball's question, said that an oculist in Darmstadt, Germany, pulls out all the hairs on the eyelashes previous to operating for cataract.

Dr. A. E. Prince, of Springfield, Ill.: All that has been said and written with regard to the preparation of the eye preliminary to cataract extractions or operations on the eyeball has reference to rendering the conjunctival sac antiseptic. A case occurred in his practice which led him more than any other to the opinion that some attention should be turned to the preparation of the inter-vascular circulation of the conjunctiva and the preparation of the nutrition of the patient. These patients should be examined with reference to the condition of the blood, so as to withstand the invasion of micro-organisms. In the case referred to, an operation for entropion was performed, and following it there was considerable swelling about the tissues of the lids, followed in three days after the operation by a corneal ulcer. It was an old case of trachoma. It was entirely healed, and the cornea was normal. This ulcer was serpiginous in character, and extended about and encircling the cornea, with the center of the cornea smoky. The eye was thought to be lost. As a matter of desperation, the lady was given 3 grains of quinine and 10 drops of tincture of iron every three hours, also the sixtieth of a grain of strychnia to increase the circulation of the heart. Upon investigating the previous history of the case, it was found that she had had boils, having had seven on one arm. At the time of the operation she seemed to be a well woman, and the operation was performed without asking any questions about these boils. Fortunately the treatment improved the condition. The wound in the skin of the lid showed no tendency whatever to heal. After fortifying her system with internal medicament, the wound assumed a healthy condition, nutrition was established, the wound healed, and the cornea was saved. This may seem a digression from the subject under discussion, but the point is brought up in order that we should look to the condition of nutrition of the individual upon whom the operation is to be performed, such as is illustrated and presented in this case. If bichloride of mercury, warm boric acid solution, or the biniodide of mercury are used, if the intervascular circulation of the conjunctiva is not in good condition, the cornea will slough. If the micro-organisms enter the conjunctival cut, and the condition of the blood is such that it is not phagocytic, the cornea will slough, and there will be trouble. The preparation of the conjunctiva should be looked after by thoroughly inspecting the nutrition of the patient, and making it as important a part of the preparation as irrigating and dropping in solutions and antiseptics for several days in advance.

Dr. L. R. Culbertson, of Zanesville, O., has not used bichloride of mercury excepting in sub-conjunctival injections. He always uses formaldehyde solution in the strength of 1 to 3,000, or of 1 to 6,000, and thoroughly irrigates the lids, eyelashes and eyebrows before operation. Before operating he inquires as to whether there is a rheumatic or gouty tendency, or whether there is any tendency to diabetes, and if there be such a tendency requests that a nitrogenous diet be shut off. If there is nothing more than a slight inflammation, the patients are given salicylate of strontium, which is one of the valuable salicylates, and in this way trouble is avoided as far as possible from uric acid and its effects. By shutting off all starches and sugars it will lessen any inflammation where there is a diabetic tendency.

Dr. ———, instead of putting bichloride of mercury into the conjunctival sac, has found it excellent practice to have the patient take it internally. During the last four or five years has used no solutions of any kind within the conjunctival sac if it be healthy, and also if there be no disease of the lachrymal apparatus or nasal trouble. He has paid a good deal of attention to the preparation of the patient, and has followed out the suggestion given in a little manual by Gould and Pyle, of administering a mixture of bichloride of mercury and iodide of potassium, syrup of sarsaparilla and water, so that the patient gets in the neighborhood of the twenty-fourth of a grain of bichloride of mercury for two days prior to the operation, leaving the eye and conjunctival sac entirely alone. It has occurred to him from personal experience that we are liable to, and oftentimes do, irritate the conjunctival sac in our attempts to render it aseptic. This irritation, no doubt, has been the starting point of infection in many cases, which after the operation has ruined all the work that we have attempted to do for the patient, so that if by proper preparation of the patient prior to operation we can avoid the use of antiseptics in the eye, we have at least gained one good point, that is, we have certainly not added any additional irritation to the eye in our attempts to render the conjunctival sac aseptic.

Dr. A. C. Corr, of Carlinville, Ill.: Reference has been made to the nasal apparatus, to see that it is all right. Now, it takes a great deal of insight and close examination to see whether it is all right or not, and even though you may spray out the nasal cavity and wash out the conjunctival sac, if the outside area is not immediately cleansed, there are germs enough left to infect the eye in a day or two, or soon after the operation. He wishes to emphasize this particular point, that if you slit up the canaliculus and nasal duct into the nose, plugging it up from below, and keeping it so until the corneal surface is healed, it would be an admirable plan.

Dr. Corr believes the point mentioned by Dr. Prince is one of great importance, namely, that we have lost sight, in our ardent zeal after more antiseptic preparations, of the importance of paying particular attention to the nutrition of our patients in connection with operations upon the eye. Patients with an impoverished condition of the blood do not recuperate very rapidly after surgical operations upon the eye, and consequently it is important for us to bear in mind the nutrition of the patient.

Dr. Frances Dickinson, of Chicago, agreed with Dr. Prince's constitutional treatment in these cases, and thinks boric acid and the bichloride of mercury treatment have their place. She doubts if it is wise for us to use any one of them exclusively. In a case for operation on the eye, it is necessary to examine the patient's urine before operation, and we should see to it that the processes of elimination are being carried on properly. Nutriment is carried to the eye by the blood-vessels; waste is carried off by the blood-vessels and the lymphatics. We have all the circulatory processes going on in the various structures of the eye which we must consider in dealing with diseased conditions of it.

Dr. H. Knapp, of New York, said the majority of cases of cataract he had lost were bad operations, the fault being on his part, and no one here has touched upon this point. He has lost more cases from one fault than all the rest, and that is insufficient preparation. He has produced septic conditions by so doing. Every oculist who has performed many cataract operations must necessarily be of the same opinion. He sees about one-half of one per cent. of suppuration in his cases. Remembers the work he did last winter. He had one hundred and eleven extractions from October until now, and there was one case of suppuration; the eye was lost. It was a case of suppuration of the iris. He has abandoned almost all antiseptics, and simply endeavors to keep the eyes of his patients thoroughly clean. If any one of his patients has conjunctivitis, or anything of the kind, he refuses to operate on him until this condition is cured. He does not bandage the eye, as he is inclined to think that it brings about congestion. In these cases we cannot sterilize the skin of the conjunctiva completely, but nevertheless we will get good results in most of the cases from operative interference. A healthy man stands much better chance for a prompt recovery than one whose nutrition or vitality is lowered. The case lost this winter was a gentleman ninety-one years old. The operation was performed upon him, as far as could be seen, without any fault whatever in technique. The eye was completely compressed like a wet cloth. The lens came out completely. There was an angular folding of the whole eye. The next day he had some irritation, and two days later the inflammatory condition seemed to be only of a mild character, but it proved to be a purulent iritis. The iris was greatly swollen, and the pupil was filled with yellowish material. The wound was at once opened and what matter there was in the anterior chamber let out. This was done daily, and the eye got well. He left three weeks after the operation, there being not a particle of sloughing in the cornea, but there were evidently changes in the iris, and the perception of light was poor. If a similar case should present itself in the future, the patient being extremely old who showed no power of resistance, he would inject physiological warm salt solution, so as to restore the parts to their natural condition. The cases in which suppuration took place were those in which an insufficient section had been made. Dr. Knapp considers a clean operation, where the wound and everything are in the best condition, more important than the use of antiseptics.

Dr. Albert Hale, of Chicago: We seem to follow in the line of the obstetricians in our attempt to disinfect the mucous membrane around the eye, and we cannot do it any more than the obstetrician can disinfect the passages for the birth of the child. In his obstetrical studies in Prague, it was taught that it was a difficult matter to render the vagina aseptic, and students who are now coming back from there say that no effort is made in normal cases to disinfect the vagina. It is left to nature to carry on the normal secretions, and why should we not leave the conjunctiva alone? Dr. Hale's remarks do not apply to cases of conjunctivitis or any condition similar to it, but an eye that comes to us for operation. So far as statistics are concerned, the result of an operation will be better if the eye is not previously irritated by agents with which to obtain asepsis. If we take a lesson from obstetricians in this particular, it will be valuable to us.

Dr. Fryer (closing the discussion) believed there are many cases in which the wounds heal after cutting operations without any germicides. He believes it is so in the majority of cases. The single loss of an eye is a serious matter. We cannot tell in any case whether an eye is infected or not without making a microscopical examination of the secretions, or putting on a dressing and watching it. He has been misunderstood in regard to the dressing after operations. The patient is generally allowed to go forty-eight hours after the first dressing. This can be done if the operator is careful in his antiseptic work.

In regard to solutions, there is a great deal of carelessness on the part of druggists in making these preparations. You may order 1 to 5,000 or 1 to 10,000 solution, and they make it double the strength. These solutions must be correctly made. A case was recalled that he had had within a month, in which the operation was clean and the man had been prepared two weeks before operation, but at the end of the fifth or sixth day the bandage was taken off, and he rubbed and scratched his eye. The eye was examined carefully and the wound found partly open. The eye was infected and a small quantity of pus was found in the anterior chamber. An antiseptic dressing was applied, shortly after which the pus disappeared. Dr. Fryer has rarely ever seen any of these cases of pus in the anterior chamber without serious results following them. Dr. Dayton and others spoke of boric acid. Careful experiments by bacteriologists show that boric acid is inert as a germicide. In old men with prostatic trouble, upon whom we operate, we should examine the urine for albumin and sugar in every case. We should know whether the patient has had diabetes or renal trouble. We ought to know this before we operate, particularly the general condition of the patient, which has an important bearing on our operative procedures. Dr. Ball spoke of the sweat glands as being a source of infection of interfering with healing of the wound. We should look out for that. Dr. Fryer agrees with Dr. Prince of the importance of looking after the general nutrition of the patient and the condition of his system. He would not have operated on Dr. Prince's case at all, nor would Dr. Prince have done so if he had known the patient had had boils. Boils are indicative of a depressed condition, which we must correct before we operate upon the eye.

Dr. Knapp has alluded to insufficient section in these cases. Dr. Fryer thinks he has probably seen as many of Dr. Knapp's operations as any one present, and would say if there was any imperfection it had nothing to do with the unsuccessful case.

Dr. H. Gifford, of Omaha, Neb., followed with a paper, entitled *Four Cases of Parinaud's Conjunctivitis.* This disease was first described by Parinaud in 1889, and hitherto nine cases of it have been described in France, while in Germany and Austria the same disease has been described by Goldzieher as lymphomatous conjunctivitis. It is characterized by rapid swelling of the lids, with more or less muco-purulent discharge and the development on the folds or tarsi, or both, of large rounded granulations, which not infrequently are fungiform or polypoid in form. Between the granulations small conjunctival ulcers sometimes occur. Soon after, or in very rare cases, before the affection of the lids, the lymphatic glands of the neck and face on the affected side generally become swollen and tender to a very marked degree, and suppuration not infrequently occurs. The disease is almost invariably onesided, is apparently not contagious, and appears to undergo a spontaneous cure in the course of some months when left to itself. Treatment in the worst cases affects the disease very slowly. The cases in which the tarsal surfaces are covered with granulations might be mistaken for very pronounced trachoma, while in those where ulcers of the folds surrounded by granulation tissue occur, the question of tuberculous conjunctivitis might be raised. The cornea is rarely, if ever affected, and the subjective symptoms are comparatively slight. Parinaud has called the disease infectious conjunctivitis of animal origin, partly because some of the French cases were butchers or farmers, but the evidence on this point is not at all conclusive. Bacteriological investigations as to its cause have been practically without positive results. Two of Gifford's cases were somewhat atypical in so far as that in one of them the swelling of the lymphatic glands was confined to a row behind the sterno-mastoid muscle, while in the other the granulations were hardly as large as usual, the most prominent conjunctival feature being the presence of numerous ulcers mostly on the folds, but some of them on the tarsi and bulbar conjunctiva.

Dr. T. A. Woodruff, of Chicago, read a paper on the *Use of De Zeng's Refractometer*. The conclusions of the paper are: (1) It is not a time-saver. (2) It is not accurate in determining the amount and axis of the astigmatism. (3) It is liable to produce an over, rather than an under, correction of the astigmatism. (4) In old people, or where a cycloplegic is contraindicated, it will prove of assistance. (5) In myopia and hypermetropia it is satisfactory in determining the amount of error under a cycloplegic.

Discussion.—Dr. Frank Allport, of Chicago, has used the De Zeng refractometer somewhat, and regards it as a very useful adjunct. It is not accurate any more than any other method of arriving at errors of refraction. He would not depend upon the refractometer absolutely, neither would he depend upon skiascopy or upon the ophthalmometer. It is a much more accurate method of estimating the axis of astigmatism than the one which is perhaps almost universally used, namely, the ophthalmometer. The refractometer is an instrument which is as valuable as any means we have at our command for estimating errors of refraction, except, of course, the test lenses under a mydriatic. Dr. Allport regards the refractometer as a valuable adjunct, and would not like to be without it. It is quite necessary, however, to use a mydriatic in estimating errors of refraction with this instrument as with any other method.

Dr. Frances Dickinson, of Chicago, does not think the refractometer is to be relied upon as a last resort unless we use a mydriatic; but considers it as an aid, and would not like to do without it. It has this disadvantage, as all instruments have, namely, that it does seem to influence the patient to use the accommodation, though it is not intended to do so. It is not a time-saver.

Dr. A. E. Prince, of Springfield, Ill.: It is generally conceded that the test lens in determining the amount of the error of refraction work is the last court of appeal, and Dr. Prince makes the appeal to begin with, of using the test lens. So far as he is concerned, we may use of any device that will do away with a reliable cycloplegic. If you get your axis of astigmatism by these devices, you have to appeal to your test lens before you are satisfied anyhow, and why not use the test lens to begin with?

Dr. A. E. Prince, of Springfield, Ill., read a paper on the subject of *Extreme Non-cicatricial Ectropion of the Lower Lid.* He summarized an experience of fifteen years, during which time he has been treating these cases by means of an operation, which he described as follows: (1) Slit the canaliculus of the lower lid, if it has not already been done. (2) Make a linear incision 2 mm. from and parallel to the lid margin, through the conjunctiva and tarsus, extending the entire length of the tarsus. (3) Midway and transverse to the line of this incision, divide the tarsus with the least possible injury to the conjunctiva. The author does this by the introduction of the Graefe knife between the conjunctiva and tarsus. Each half of the divided tarsus is now to be grasped at the free end, and dissected out, leaving the conjunctiva intact. This is accomplished by means of Stevens' tenotomy scissors. (4) The lid is supported by a bandage for three days, when the patient is discharged, with directions to use digital massage in an upward and inward direction. In the absence of general anesthesia, he recommends a four per cent solution of cocaine, and locally, a sixteenth per cent solution to the inverted lid. No stitches are required. He reported a number of cases, one of which he had seen as long as ten years after the operation. In every case the result has been permanent. In conclusion, he said that the hypothetical objections to the operations were two: First, the meibomian glands are destroyed by the incision; second, the removal of the tarsus takes away the vertical support to the margin of the lid. To the first objection, he urged that in cases where this operation is indicated, the function of the meibomian glands have already, in large part, been destroyed. The second objection is not sustained by experience. The margins of the lids are supported by the commissures, and the lateral contraction in the course of the healing has been found sufficient to insure the permanent apposition of the margin of the lid to the surface of the cornea, without exercising any undue pressure; it is obvious that the operation is not indicated in minor cases of displacement. Likewise, it is useless in cicatricial cases of ectropion, but if given a trial in properly selected cases, in cases of extreme non-cicatricial ectropion of the lower lid, the results will be sufficient to secure its reputation.

Discussion.—Dr. J. P. Worrell, of Terre Haute, Ind.: Dr. Prince's paper called to his mind a case which answers the description of one upon which he operated some two years ago. The patient applied for cataract operation. There was extreme entropion, the result of a neglected purulent ophthalmia. His operation differed from that of Dr. Prince's, in that he did not sacrifice the tarsus. An incision was made parallel to the margin of the lid, at perhaps, five millimeters from the margin, and was followed by another parallel with it, and these two incisions were united at the inferior margin of the tarsus. In this way a wedge-shaped mass was removed, and even without putting in any stitches the lid was held in place with an admirable result. Opening of canaliculus was made preliminary to the operation.

Dr. Prince (closing the discussion) attributes the good results to the cicatrization. The tarsus, when it becomes misshapen and hypertrophied, crowds the lid upwards, and if we remove a portion of it sufficient to have cicatrization lengthwise with the margin of the lid, we effect the same results as we would by excision of a portion of the tarsus. He opens the tear duct at the time of the operation.

Dr. A. C. Corr, of Carlinville, Ill., read a paper on *Choroiditis and Choro-retinitis in Young Persons.* The essayist said that his own observations in practice had not been such as to enable him to agree with the ordinary teaching of the books and didactic instructions on the subject of choroiditis. From this source almost all cases of choroiditis that could not be unquestionably classed as rheumatic, gouty, or traumatic, were at once considered as syphilitic, and this latter is confirmed and a positive diagnosis is made if any improvement or a favorable modification follows the use of mercury and iodide of potassium. It was this "trump" etiological diagnosis that he wished to inveigh against. The author gave a brief history of five cases selected as best illustrating choroiditis with retinal hyperemia as he sees it in private practice in young people, and without any possible syphilitic taint, approximately or remotely, and which he believes originates from excessive functional activity of the eyes.

Discussion. Dr. J. E. Colburn, of Chicago, has found quite a number of cases corresponding in clinical history in appearance to the one described by Dr. Corr. He knows that other gentlemen present have been making similar observations, and would like very much to have them give expression to their thoughts if they are willing to do so at this time.

Dr. C. D. Wescott, of Chicago, has seen quite a number of these cases, and agrees thoroughly with what Dr. Corr has said, that many of them are not traceable in any way to syphilis. He has absolutely been discouraged in searching for the cause in some cases. In others he has attributed it to taxing the eyes too much when the general condition of the body was not up to par. He has put the eyes absolutely at rest and has done everything which seemed indicated to improve the general tone and purity of the blood. Some of the cases are unquestionably relieved by the proper use of salicylates in connection with absolute rest of the eyes. He has promoted elimination in all instances, as much as possible, while trying to increase the general nutrition and improve the condition of the patient. In some cases he has been obliged to interdict the use of the eyes for months, and even a year, and his ultimate results have been very much like those reported by Dr. Corr, very gratifying.

Dr. J. P. Worrell, of Terre Haute, Ind.: The importance of the choroidal and retinal troubles in school children, who use their eyes a great deal, cannot be overestimated. The frequency with which changes take place in the retina becomes obvious. Every one who has been called upon to study the eyes of children for statistical purposes, and the frequency with which choroidal and retinal changes are found, has been impressed with the importance of the subject, You are doubtless familiar with the results of Dr. Risley's investigations in school children in Philadelphia, which were made with a view of ascertaining what relation there was between myopia and the changes in the eye-ground. Some recent investigations of Dr. Worrell's have substantiated Dr. Risley's statements, and in cases of hypermetropia and astigmatism we find in more than 50 per cent. of the cases some evidences of retinal and choroidal changes. In nearly 50 per cent. of the cases we will see more or less change around the optic disc. In many of them, however, we will find a low degree of vision, and when we come to search for the objective changes, we cannot always find them. Perhaps there is a spotted or granular appearance of the retina, or a slight degree of it, so that we cannot absolutely say it is present. There may be slight scotoma and absolute correction of the refraction; putting the eye under atropia, the use of alteratives, and rest for the eyes constitutes the line of treatment. One of the most gratifying things that comes to us is to have a child under our care that is substantially blind, for all reading purposes, and in the course of three or four weeks to have its acuity of vision come up to normal by judicious treatment.

Dr. J. E. Colburn, of Chicago, has now under observation a young girl whom he has known for fifteen years. He first saw her when she was a child of three, and again as a child of thirteen, at which time glasses were ordered giving her 20/20 vision. She had eye fatigue and an error of refraction, 1 D. of hypermetropia. She did not like to wear the glasses she had. Her general tone was very much lowered, and a protracted examination at intervals of two or three days showed almost uniformly vision of 10/10. All of the functional activities of the different organs were being interfered with. It was not until the renal activity was increased that any result was reached so far as rest to the eyes and general improvement were concerned. But just as soon as the solids were increased, and the general nutrition and tone of the patient improved, vision came up, too, and is now 20/30.

Dr. Corr (closing the discussion): There seems to be a large per cent. of the cases, in which the cause is not accounted for. There seems to be an inborn condition or weakness of the ocular tissues that makes the eyes of one child weaker than those of another. One child is tough and robust, the other is frail, and this condition of the eyes exists without there being a gouty, rheumatic, or syphilitic history. He believes excessive functional activity of the eye is a means of accounting for the trouble. The treatment he advised and carried out is to have these patients absolutely refrain from active use of the eyes. If this cannot be done, it may be necessary to paralyze the ciliary muscle with atropia, and prescribe correction at the same time for near points, so that the eye cannot be used for accommodation, and have the prism turn in so as to render it unnecessary for the eye to converge. He endeavors to put the eye in such a condition that it can be used.

Continued in June number.

THE ANNUAL MEETING of the Midland Ophthalmological Society convenes at the Coates House, Kansas City, Mo., June 3, 1898. There will be one day session, viz., morning and afternoon, with a social evening. This meeting takes place on the third day of the Military Medical Convention, which is also to be held in Kansas City, Mo., and precedes by three days the American Medical Association, which is to be held at Denver, Col.

The Midland Ophthalmological Society meets regularly once a month for local members, and twice a year for all who may wish to attend. A large number have already promised to be in attendance at the June meeting—Culbertson, of Zanesville; Würdemann, of Milwaukee; Rumbold, of St. Louis, and many others of equal prominence that our space forbids us to mention.

NEWS ITEMS.

Personals and items of interest should be sent to
Dr. Frank Allport, 92 State St., Chicago.

EXCHANGES should be sent to Dr. T. A. Woodruff, 1102 Reliance Bldg., Chicago.

DR. E. VON HIPPEL, of Heidelberg, has received the title of extraordinary professor.

DR. R. H. TAYLOR, lecturer of ophthalmology at the Medical School of Liverpool, is dead.

TÜBINGEN.—Dr. Carl Grunert, assistant physician to the eye clinic of the University, is now established as privatdocent.

ST. PETERSBURG.—Prof. Dr. L. Bellarminoff, a. o. professor of ophthalmology, has been appointed ordinary professor to the Military Medical Academy.

BERLIN.—Privatdocent Dr. R. Greef, director of the eye department in the K. Chareté Hospital, has been given the title of extraordinary professor.

TURIN.—Dr. M. Peschel has been appointed a. o. professor of ophthalmology to the University.

DR. FRANK ALLPORT, of Chicago, has accepted a position as professor of ophthalmology in the Chicago Policlinic.

DR. EDWARD NETTLESHIP has given £250 to the Royal London Ophthalmic Hospital, for the purpose of providing apparatus and appliances for the laboratory and museum in the new hospital now being built in the City-Road.—*The Canadian Journal of Medicine and Surgery.*

GOOD EYE-SIGHT is not decreasing among Germans in the British army. On the contrary, according to statistics furnished by Surgeon-

General Seggel, the proportion of recruits endowed with more than the normal power of vision is now 92 per cent, whereas in 1873 it was not more than 56 per cent.—*British Medical Journal.*

GALEZOWSKI has devised an "eye thermometer," which he claims is valuable in diagnosing certain eye diseases.

THE NEXT MEETING of the "German Ophthalmological Society" will convene at Heidelberg, August 4, 1898.

THE NEXT MEETING of the "Societé Francaise d'Ophtalmologie" will meet May 2d, in Paris. The subject for discussion will be "The Intraocular Hemorrhages of Young People," led by Abadie, of Paris.

THE CHAIR of diseases of the eye, ear, and throat at the Medical College of Virginia, made vacant by the death of Prof. Charles M. Shields, will be filled at the annual meeting of the board of visitors of the college, April 21st. All applications, accompanied by credentials, should be forwarded to Christopher Tompkins, M. D., Dean, Richmond, Va.—*New York Medical Record.*

The following officers were chosen at the meeting of the Western Ophthalmologic and Oto-laryngologic Association, Chicago, April 7–8, 1898: President, Dr. J. Elliott Colburn, Chicago; First Vice-President, Dr. Wm. Scheppegrell, New Orleans; Second Vice-President, Dr. Casey A. Wood, Chicago; Third Vice-President, Dr. Harold Gifford, Omaha; Secretary, Dr. F. M. Rumbold, St. Louis; Treasurer, Dr. W. L. Dayton, Lincoln, Neb. Committees—Program: F. M. Rumbold, chairman; H. V. Würdemann, Harold Gifford. Publication: Adolf Alt, chairman; M. A. Goldstein, T. A. Woodruff. Membership: Casey A. Wood, chairman; George Knapp, E. C. Ellett. Arrangement: Wm. Scheppegrell. The next meeting will be held in New Orleans.

IT AFFORDS the RECORD much pleasure to announce that the chair of ophthalmology and otology in the Rush Medical College, recently vacated by the respected and revered Dr. E. L. Holmes, will be filled by Dr. F. C. Hotz, of Chicago.

Dr. Hotz's name is too well known to require any introductory or eulogistic remarks from THE OPHTHALMIC RECORD. His reputation extends wherever ophthalmology is known, and in inviting him to occupy this chair Rush Medical College has honored itself.

The debt of this college having been canceled, and its adoption into the Chicago University having been consummated, the chair of ophthalmology and otology in this institution should be one of the most important of its kind in the United States, and the RECORD is confident that with Dr. Hotz as its occupant, this chair will fulfill its destiny.

THE *Advertising Ophthalmic* Specialist.—We have received a circular letter emanating from the "London Ophthalmic Institute," accompanied by a little work by "Our Consulting Specialist, one of the leading refractionists of the day." The refractionist's name is D. Shepperd, and there is one statement in his book with which we are in most hearty accord, viz., where he says, "One of the greatest curses existing in Great Britain to-day, is the trade carried on by quack opticians." Mr. Shepperd, however, as we learn from the Secretary's letter, "In order to ascertain the existence of astigmatism now so prevalent————will specially diagnose each case separately." This is indeed a favor!

Mr. Shepperd's views on cataract are that "it is frequently caused by the want of using glasses in proper time, from using improper glasses, or from the use of common lenses." This pathology is quite new to us. We should like to know how many cases of commencing glaucoma Mr. Shepperd has "diagnosed" as commencing cataract.—*London Lancet.*

NOTES from the "Ophthalmological, Otological, Laryngological and Rhinological Association," which met in Chicago, April 7th and 8th:

A long-suffering profession will be gratified to learn that the name of this association has been changed and somewhat mitigated. It is now called the "Western Ophthalmologic and Oto-Laryngologic Association." We sincerely hope that at the next meeting of this association the name may be still further shortened, in order that the every-day practitioner may pronounce it without producing a dislocation of his lower maxilla.

The meeting in Chicago was the most successful one in the history of the association, and was inspiring, not only from the many really good papers which were presented, but on account of the presence of many specialists of national, and even international reputation.

Dr. Henrotin, President of the Chicago Medical Society, delivered a very able Address of Welcome, and Dr. Fryer, of Kansas City, presided with his usual grace and ability. Dr. Hugh T. Patrick, of Chicago, delivered an address by invitation, which was cordially received by the society. The most important event of the meeting was doubtless the address of Dr. Hermann Knapp, of New York City, on "The Radical Tympano-Mastoid Operation." Dr. Knapp's address was enthusiastically received, and it is certainly to be regretted that being an address it could not be discussed.

Among those present were, Alt, of St. Louis; Gifford, of Omaha; Goldstein, of St. Louis; Scheppergrell, of New Orleans; Reynolds, of Louisville; Barck, of St. Louis; Prince, of Springfield.

AT A RECENT meeting of the Bath and Bristol branch of the *British Medical Association*, the President, Mr. F. Richardson Cross, showed by diagrams and cases the results of some operations for removal of the lens in high degrees of myopia. He reports good results, and believes in the operation as having passed the experimental stage, and as standing now on a solid footing. His views were concurred in by Mr. W. M. Beaumont, Mr. C. H. Walker, Dr. C. Hailes, and others.

Dr. Colburn, of Chicago, was elected President. As he showed such ability as chairman of the Committee on Arrangements, we predict that the society will thrive under his leadership.

About one hundred physicians attended the meeting. The society received about twenty-five new members.

The next meeting of the "Association" will be in New Orleans, and as the date of meeting is just prior to the Mardi Gras, those attending the meeting will be enabled to stay over for a few days and enjoy the gaieties of the southern capital.

THE SANTA FE ROUTE to Denver is the scenic line. It passes through Colorado Springs, affording a magnificent view of Pike's Peak, as well as a view by daylight of the Rocky Mountain range for a distance of more than one hundred miles. The service is very comfortable.

AMERICAN MEDICAL ASSOCIATION MEETING.

For the convenience of those wishing to attend the meeting of the American Medical Association, June 7–10, at Denver, THE OPHTHALMIC RECORD has arranged for a special through train via the Chicago, Union Pacific and Northwestern line, leaving Chicago, Sunday, June 5th, at 6:30 P. M., arriving in Omaha Monday morning, where a stop will be made all day, in order that the party may visit the trans-Mississippi Exposition. The train will leave Omaha Monday evening, and arrive in Denver about 8 A. M. Tuesday morning, in ample time for the opening session of the American Medical Association. A single fare, plus two dollars, has been granted for the round trip, allowing one month in Colorado. For further particulars and reservations apply to Editorial Secretary OPHTHALMIC RECORD, 1102 Reliance Building, Chicago.

THE

OPHTHALMIC RECORD

A MONTHLY REVIEW OF THE PROGRESS OF OPHTHALMOLOGY.

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ORIGINAL ARTICLES.

PARTIAL OPTIC NERVE ATROPHY AND CENTRAL SCOTOMAS (SO-CALLED CENTRAL AMBLYOPIA), APPARENTLY DUE TO CHRONIC LEAD POISONING.*

BY G. E. DE SCHWEINITZ, M.D.,
OF PHILADELPHIA.

Illustrated.

The following cases of central amblyopia present certain clinical features of interest, and in one of them lead, so far as chemical tests are concerned, appears to have been the cause of the ocular symptoms:

Thomas Ryan, aged 35, born in England, single, a house-painter, was admitted to the medical wards of the Philadelphia Hospital on the 24th of December, 1897, on account of progressive weakness in the legs, chronic constipation, some cough with expectoration, and dim vision.

History.—The patient suffered from the usual illnesses of childhood. He denies syphilitic infection, but confesses to having had a chancroidal bubo and one attack of gonorrhea. He has been accustomed to drink spirits, and has used tobacco freely, especially by chewing, but had used neither tobacco nor liquor for two months before admission.

The man is a painter by occupation, and has followed that calling for fifteen years. His last work, however, was done five months before he entered the hospital. He has suffered at times from colic, but never typically from painter's colic, nor has he ever had wrist-drop. For the past two years he has been ailing, and for a number of years he has suffered much from persistent constipation, always requiring laxatives to secure a movement of the bowels. About November, 1897, he began to notice that his vision was failing, his attention being first directed to this symptom by his inability to read ordinary print. The failure in vision was unassociated with pain or other sign of inflammatory action.

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*Read before the Ophthalmic Section of the College of Physicians of Philadelphia, April 19, 1898.

Examination.—The patient is a somewhat emaciated, pallid man, with purplish eyelids and weak, discouraged voice. There is retraction of the left apex and harsh breathing, but no tubercle bacilli could be found in the sputa.

On admission, it is stated that examination of the urine did not reveal abnormalities, but three months later an examination by the resident, Dr. George M. Purves, gave the following result: Reaction acid; specific gravity 1017; trace of albumin with the nitro-magnesium test; no sugar; microscopically a few pale, granular casts and bladder epithelium.

There is no special disturbance of the mental faculties, except that the patient is rather slow in answering questions, this slowness being apparently due more to weakness and indifference than to any lack of mental qualifications. The knee-jerks are increased, and the grip of the right hand is stronger than that of the left.

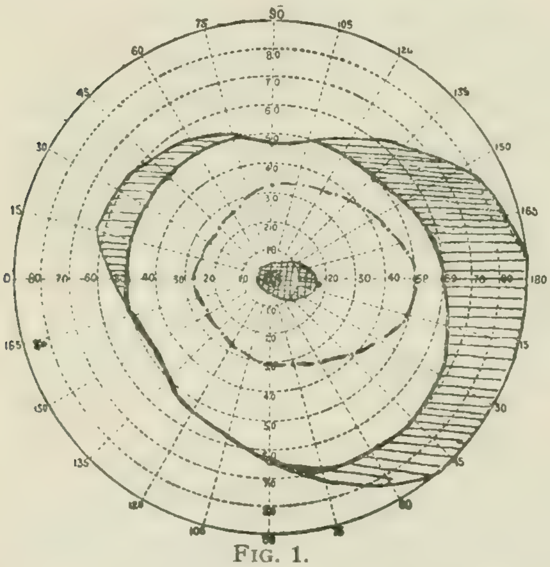

FIG. 1.

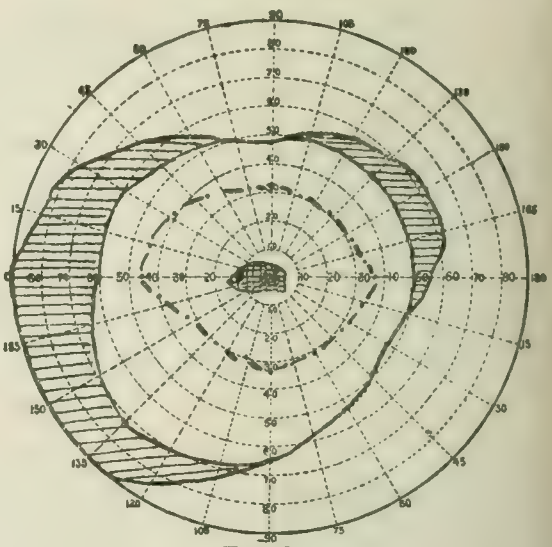

FIG. 2.

Eyes.—Vision of the *right eye* 5/60; with + 4 spherical D.=2 at 25cm. The disc is nearly circular, with a scleral ring well marked all round, a sharp central excavation and faint choroidal ring outward, and some moderate choroidal disturbance in the circumference. The entire deeper layer of the disc is greenish, and considerably more than its temporal half is of a grayish-green color; superficial capillarity is preserved upon the nasal side. There are no lesions in the macula, no changes in the central circulation, and no noticeable perivasculitis.

The field of vision shows slight contraction of the form field, particularly upon the temporal side, a moderately good red field and a central scotoma, oval in form and for the most part *relative* in character, extending from 3 degrees on the nasal side to 12 degrees on the temporal side, and 3 degrees above and 7 degrees below the point of fixation. Directly surrounding the fixing point and within the relative confines is a small *absolute scotoma*, about 3 degrees in diameter. (Fig. 1.)

Left Eye.—Vision 5/35; with + 4 spherical D.=2 at 25cm. The description of the fundus of the right eye already given applies also to the background on the left side, and the field of vision is very similar, containing an almost exactly similar scotoma of slightly smaller dimensions. (Fig. 2.)

The pupillary reactions are normal, and there are no palsies of the external ocular muscles.

In searching for an etiological factor to explain this case of optic nerve atrophy with central scotomas, we naturally think of toxic agents, inasmuch as the physical examinations have not given any evidence, at least any evidence at the present time, of either disseminated or fascicular disease of the cerebro-spinal axis, and syphilis seems to be excluded by the history of the case as well as this disease can ever be entirely eliminated. The later examinations of the urine indicate the probable existence of chronic interstitial change in the kidneys. The patient has a phthisical history, his father having died from this disease, and he himself looks phthisical, but bacilli are not to be found in his sputa. He has taken liquor, and has chewed tobacco to excess, but has not been recently either a chewer of tobacco or a drinker of spirits, having perforce abstained from these two drugs for at least two months.

He has been a house-painter for fifteen years, and therefore it is reasonable to look for signs of lead toxemia in his system. The old sign at one time so much relied upon, namely, the blue line around the gums, was not to be demonstrated, and in this particular investigation I was aided by Dr. Frederick Packard, who has had unusual experiences in the investigation of the so-called blue line in lead poisoning.

On the 22d of February the urine was tested for lead by the method which has recently been much recommended in qualitative analyses, and which was suggested to me by Dr. Packard, namely, by means of oxylate of ammonium and a strip of magnesium, and heat in the presence of a crystal of iodine. As a result the yellow iodide of lead was deposited.

Subsequently, at my request, Dr. Alonzo Taylor attempted to make a quantitative estimation of any lead that might be found in the urine, but reported his inability to get a lead reaction, pointing out at the same time the well-known fact that the elimination of lead in the urine in cases of chronic poisoning is not constant, and that it may be lacking for days at a time without any reason being apparent. Therefore another examination was made of the urine collected for twenty-four hours, and the following is Dr. Taylor's report: "The urine contains a small quantity of lead, eight milligrammes by weight as lead. Since the quantity is minute, the natural errors of even the best method count for more than if a larger amount were concerned. The error is entirely in the direction of loss; two milligrammes may have been lost in the process. Even in well-marked cases of plumbism the urine may contain only such small quantities."

Case II.—Thomas Stevens, aged 59, born in the United States, married, a house-painter, applied for treatment in the Eye Dispensary of the Jefferson Medical College Hospital on November 26, 1897, on account of failing vision.

History.—The patient says that he has had good eyesight until eighteen months before he applied for treatment, when "vision left him in half an hour." It gradually returned, and now he sees better than at that time, but still cannot use his eyes for anything like accurate vision. The central visual acuity was $\frac{15}{cc}$ and $\frac{20}{cc}$ respectively; the ophthalmoscopic record is: both nerves grayish, retinal vessels small, central scotomas for red and green. He was referred to the Nervous Clinic for further examination; but the examinations were negative so far as central nervous disease is concerned. There was no history of syphilis or rheumatism. The knee jerks were increased.

I first examined the patient on the 12th of February, 1898, vision at that time in the right eye being 10/cc and in the left eye 20/cc. Both nerves showed general gray-white atrophy; the veins were slightly tortuous and, compared with the arteries, large; the arteries were small, and there was well-marked, though not exaggerated, perivasculitis. Both pupils reacted normally, and there was no paresis of the external ocular muscles. The field of vision was as follows: Marked concentric contraction, especially upon the right side, very decided contraction of the red field and green blindness. In each eye there was a central scotoma extending from somewhat on the nasal side of the fixing point to about twenty degrees beyond it, in which area the appreciation of red and green was entirely lost. There was, however, no scotoma for blue, and no spots of absolute loss within the relative area.

The patient had nothing in his history which gave any good excuse for this optic nerve atrophy and perivasculitis, except exposure to lead. He smoked two cigars a day, was not a drinking man, had worked steadily at his trade, but not quite recently, had no history of painter's colic, nor had he ever suffered from wrist-drop. There were marked retraction of the gums and gingivitis. Somewhat uncertainly a blue line appeared to surround the upper incisor and left lower canine tooth. He was placed upon ascending doses of strychnine and nitro-glycerine, as he had previously taken large doses of iodide of potassium. At the end of two weeks he returned, his vision, if anything, somewhat less accurate than at the first time, namely: O.D., 10/cc.; O.S., 20/cc. Again, at the end of two weeks there was some depreciation of central vision, namely, in the right eye 4/cc, and in the left eye 15/cc. Examination of the urine failed to reveal albumin or sugar. The tests for lead, however, it was not possible to make at that time. He had carefully brushed his teeth and kept his gums in good order, so that the gingivitis had largely subsided, and still a blue line appeared, somewhat doubtfully, around the incisor and canine.

He returned to the dispensary from time to time, and at the last examination (4.6.98) the vision of the right eye was 6/cc (eccentric), and of the left eye 14/cc; ophthalmoscopically, the lesions were the same as those already recorded. There was even greater contraction of the field of vision of each eye, especially of the right, and typical central scotomas; on the right side the scotoma now included blue and white; on the left side, as before, red and green.

The faint gingival lines previously described were still visible, but no blue patches in the mucous membrane of the lip were discoverable. His urine was again submitted to an examination, which included tests for lead, with the following result: The urine contains neither albumin, sugar nor casts. There is not a trace of lead in the entire quantity submitted to examination. Lehmann's method was employed, which for qualitative work is most delicate.

The treatment was changed to ascending doses of iodide of potassium.

If we assume that the optic-nerve degeneration in these cases was due to lead—and in the first instance the chemical examinations render this assumption a reasonable one—their record seems worthy because of the somewhat unfrequent occurrence of lead amblyopia in comparison to the number of cases of chronic lead poisoning. Bearing upon this point are Dr. Frederick Packard's* interesting researches. He examined forty-eight workers in lead, the time of exposure varying from one week to twenty-six years; the average length of time of exposure among those working in lead for more than one year being nine and one-half years. Thirty-three of these men had at one time or another exhibited symptoms indicating the toxic influence of lead, but no case of amblyopia traceable to lead impregnation was found.

Lead amblyopia is also rare, in this country at least, in comparison with the whole number of ocular diseases, although it is difficult to arrive at exact figures on this subject, as some of the cases of ocular disturbance are probably hidden under the general term, toxic amblyopia. Among more than 12,000 cases of ocular disorders recorded in the Jefferson Medical College Hospital and the Philadelphia Polyclinic during the last five years, there have been only three cases of optic-nerve or retinal change attributed to lead, and two of these are doubtful.

Finally, the percentage of lead amblyopias among the total number of so-called toxic amblyopias is small. For example, Uhthoff records 204 cases of retrobulbar neuritis among 30,000 patients; of these, 138 were toxic in origin, but only one was due to lead; tobacco, alcohol, diabetes and bisulphide of carbon furnishing the remainder.

The ocular manifestations of chronic lead poisoning may manifest themselves as a transient amblyopia, due to the anesthetic effect of lead on the optic nerve and retina; as an amblyopia due to retrobulbar neuritis, which may terminate in permanent atrophy; as an optic neuritis or neuro-retinitis specifically due to lead, which may be followed by optic-nerve atrophy; and, finally, as a vasculitis and perivasculitis of the retinal vessels.†

The first of the cases reported this evening appears to belong to that group of amblyopias due to retrobulbar neuritis, which may or may not terminate in permanent atrophy. It has been argued by Stood and others that the retrobulbar neuritis of lead is analogous to the condition which lead causes in the musculo-spiral nerve, while Parisotti, on the other hand, believes that the atrophy of the papilla, which takes place without preceding neuritis, is due to changes which lead causes in the nutrient arteries of the optic nerve, changes which we know it may cause in the general retinal circulation. The character of the scotomas which have been reported in a number of cases indicates that the papillo-macular bundle is chiefly affected. This might be expected, because an abundance of clinical material indicates that this tract in the optic nerve is particularly obnoxious to the influence of toxic agents.

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* Philadelphia Hospital Reports, III, 1896, p. 38.

† Naturally, many cases of optic neuritis, neuro-retinitis, etc., seen in chronic leadpoisoning, are secondary to nephritis or intracranial disorders. These cases are not now in discussion.

The second case, inasmuch as chemical examination failed to find lead in the urine, must, in spite of the presence of the slight bluish line on the gums, also somewhat uncertain in character, be relegated to the doubtful class. In this case there also appears to have been a neuritis, with special degeneration of the central fibers, the degeneration being much more widespread than in the first case, and associated with visible thickening of the coats of the blood-vessels and shrinking of their lumen.

OCULAR SYMPTOMS OF TABES DORSALIS.*

BY HIRAM WOODS, JR., M.D.,
OF BALTIMORE, MD.

Illustrated.

The frequency of eye symptoms in tabes dorsalis is variously estimated at 2 to 33 per cent. Gowers gives the latter figure.

Knies, in his book, *The Eye in General Diseases*, divides them into visual, motor, and pupillary. The approach of the first named is, as a rule, gradual. Commencing as an occasional dimness, it slowly advances, involving both central and peripheral sight. There are certain characteristics of this gradual failure of sight, not indeed confined to, or entirely diagnostic of, tabes, but still the usual manifestations of the disease. Central vision, both for form and colors, is apt to be preserved longer than peripheral sight. The field for both form and color contracts as central vision deteriorates, but not infrequently color field narrows out of proportion to form field or to macular vision. Upon this, Knies founds an important prognostic conclusion. He holds that when color vision

*Read before The Clinical Society of Baltimore, Oct. 22, 1897.

narrows out of proportion to white, the case will usually have a rapid course. The reverse is the case when the field for both form and colors contract pari passu. Central, or nearly central, scotomata are very rare, while vision, generally speaking, fails from periphery to center. The last vision to be preserved, as a rule, is eccentric. The lesion causing blindness is a primary gray atrophy of the optic nerve. Knies says: "The process begins as a disseminated one, and the atrophy extends in an ascending and descending direction. The middle fibres of the nerve remain longest intact, and we may therefore infer an action starting from the periphery. This may take place most readily at the place where the nerve passes through the unyielding optic foramen. The gray atrophy is also noticeable in the chiasm, tractus, and as far as the primary optic ganglia, but there is no direct connection with the degeneration in the spinal cord. * * * The retina constantly exhibits atrophy of the nerve-fibre and ganglion-cell layers, the other layers appearing essentially normal."

The atrophy bears an interesting relation to other symptoms of tabes. As a rule, both eyes are affected, the atrophy involving equally both nerves. It may appear early in the disease, and may be noted years before other symptoms. Gowers saw it fifteen and twenty years before other tabetic symptoms. "It is claimed that when blindness from atrophy of the optic nerve occurs at an early period, especially when it runs a rapid course, a slow course of the tabetic symptoms proper may be expected." [Martin, quoted by Knies.] A very rapid course of atrophic symptoms is, in the opinion of Knies, suggestive of wrong diagnosis. He says: "Rapid atrophy is more common in neuritic and sclerotic processes than in primary atrophy of the nerve substance. As a general thing, the prognosis of those diseases which may be mistaken for tabes is more favorable, and only those cases in which an autopsy is obtained may be regarded as conclusive."

In some diseases of the central nervous system which must be diagnosed from tabes, there are eye symptoms of more or less positive kind. Knies holds that in multiple neuritis involving the posterior roots, and the inflammation of an ascending type, the diagnosis may be difficult. The course is, however, usually rapid; a history of acute infection is often obtainable, while the eye symptoms differ from those of tabes. The edges of the nerve are hazy, showing optic neuritis. This does not occur in tabes. The vision may not be reduced at all, or if affected, there is central scotoma and color disturbances. Moreover, the pupil symptoms, the most characteristic of tabes, are entirely wanting. In multiple sclerosis, atrophy commences in the connective tissue. Clinical characteristics are occurrence of focal symptoms and maintenance of conduction, although this may be interfered with to a greater or less extent. Vision gets better and relapses, blindness is often out of proportion to the appearance of the papilla, and the reverse may be true. Central scotoma is not uncommon. While the pupils are usually contracted, their reflex excitability is increased, and twitching of the eyes or nystagmus is prominent. None of these occur in tabes.

A few points regarding the affections of the ocular muscles are worthy of note. Paralyses of the external eye muscles usually appear suddenly and disappear with or without treatment. Their duration may be only a few hours. Fournier makes distinction between syphilitic and tabetic paralyses as follows: In syphilitic paralysis of the motor oculi a large number of muscles are affected; in tabetic a single muscle is the rule. The former paralyses are accompanied by headache, vertigo, epileptiform attacks, etc.; none of these occur in tabetic paralysis. In syphilis accommodation is apt to go early; in tabes it remains intact a long time. Galezowski, on the other hand, thinks that unilateral paralysis of accommodation is occasionally the first symptom of tabes. Syphilitic paralyses are permanent—at least, much more so than tabetic. Regarding the sudden onset and rapid disappearance of tabetic paralysis of the eye muscles, Knies thinks that "every paralysis of an ocular muscle which occurs suddenly in a healthy person (without injury, apoplexy, or other brain symptoms, diabetes mellitus or insipidus, syphilis, albuminuria, etc.), arouses the suspicion of a beginning tabes, especially if it recovers in a comparatively short time or subsequently relapses." Berger thinks that muscular symptoms predominate over spinal in tabetics who also have syphilis, while the reverse is true in patients who are not syphilitic. The muscles most frequently involved seem to be the sphincter pupillæ, and other individual branches of the group supplied by the third, and external rectus. Knies says true conjugate paralysis is never observed. "The lesion is chiefly a primary atrophy of the nervous elements of the nerve fibers and ganglion cells. Often the nerve roots are the seat of this atrophy. If the claim of Moëbius (*Twentieth Century Practice of Medicine*) be, as I think it is coming to be, admitted, that syphilis is "absolutely and always the cause of tabes," a distinction like the above, quoted from Knies, loses its value, save as a prognostic sign. Treatment would be only more rational; for with the conditions described, one would use syphilitic treatment, whether he had a history or no, and hope his diagnosis was correct.

The pupillary are of the greatest value of all tabetic eye symptoms. It is to be borne in mind that there are two distinct actions of the pupil: One, the consensual pupillary light action; the other, the pupillary contraction associated with accommodation and convergence. This is not alone due to the fact that the ciliary, sphincter and internal recti muscles are all supplied by branches of the third. There is a mechanical element dependent upon the blood in the ciliary bodies being forced during accommodation into the iridic blood-vessels. The influence of the cilio-spinal ganglion upon the dilators of the iris is to be also held in mind. In tabes, an occasional early eye symptom is mydriasis, explained by an irritative lesion of the cilio-spinal ganglion. More common is a myosis, explainable partly as the result of a destructive, or at least inhibiting, lesion at the same ganglion, giving rise to paralysis of the dilator pupillæ. But with this myosis there comes another pupillary symptom, called by Knies "reflex pupillary rigidity." This is attributed to "nuclear and perinuclear processes, as a result of which the centripetal fibers of the first reflex arc are interfered with or divided. The nucleus itself may be involved at a later period. This explains the comparative independence of the spinal and cerebral pupillary disturbances which may be absent or present in various combinations as the result of irritation of one part and paralysis of another."

Discussing under another section reflex rigidity of the pupil, without reference to tabes, Knies mentions the lesion alluded to above as interfering with *light* conduction to the sphincter nucleus, and says we should naturally expect as a result of this absence of light stimulus dilatation and not contraction of the pupil. He adds: "It appears as if in destruction of the fibers which break up in a terminal network in the sphincter nucleus, a constant irritation is exercised upon the ganglion cells lying within the network. This view is corroborated by Uhthoff's case, in reflex rigidity of the pupil."

Then, myosis, partly as a result of paralyzing lesion at the cilio-spinal ganglion, which slight pupillary contractions were constantly occurring during and partly from irritative lesion at the centripetal side of the sphincter nucleus, is observed in tabes. But this same lesion finally destroys the reflex at the sphincter nucleus and produces pupillary rigidity. Loss of response to light, even with unimpaired sight, results. At the same time, on convergence and accommodation, the mechanical contraction of the pupil from blood pressure remains, and there is observed a rigid and (probably, but not necessarily) contracted pupil on exposure to light, but prompt contraction to accommodation and convergence—

the Argyll-Robertson pupil. Moëbius (*Loc. Cit.*) considers this pupillary rigidity to light with action to A. and C. pathognomonic of tabes. He says that if it is present, the "diagnosis is made."

Recently I observed, rather close together, some cases illustrative of eye changes in tabes. Clinical notes of three of them are appended:

CASE I.—LEFT MYDRIASIS, WITH TEMPORARY PARESIS OF LEFT CILIARY, INTERNAL AND INFERIOR RECTI, IMPAIRMENT OF RIGHT LEVATOR PALPEBRÆ SUPERIORIS, AND SUPERIOR RECTUS, LATER DEVELOPMENT OF ARGYLL-ROBERTSON PUPIL AND TABETIC SYMPTOMS.—Mr. F. D., 32 years of age, of strong physique, and, as he believed, of unimpaired health, consulted me May 25, 1895, for these symptoms: poor vision in left eye of one week's duration, diplopia for three or four days, occasional difficulty in opening right eye, or in keeping it open, as it would sometimes "shut involuntarily." Slight giddiness, and pain in looking down were the only additional symptoms I could obtain. There was no history of illness. He confessed to having had gonorrhea, but at this time, at least, was sure he had not had syphilis. Later he admitted the possibility of such infection.

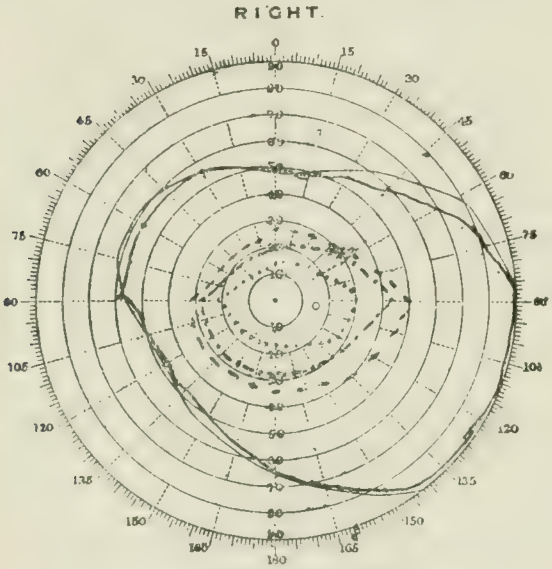

FIG. 1.

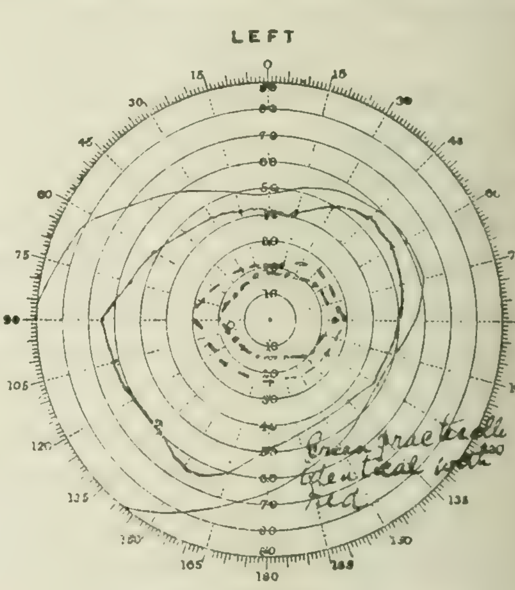

FIG. 2.

Examination showed: Media and fundus healthy in each eye; distant vision, 20/20 each; Jaeg. 1, R. E., 7 L. E. Latter read Jaeg. 1 at one-third metre with aid of +2 D. S.

Pupils: Left, a third larger than right. Both reacted to light and accommodation. Although there was left mydriasis, there was no sphincter paresis.

Extrinsic muscles: No visible deviation from parallelism, in any position nor visible defect in mobility. On exclusion, however, there was deviation, R., out and down, L., out and up. Candle test showed crossed vertical diplopia on horizontal plane, increasing in lower field, and persisting to a less extent in upper. Images on horizontal plane at twenty feet were fused by a 10° prism, base down, on L., and a 20° abducting prism on either eye. I could make out neither at this nor later examinations trouble with the levator of the right lid, though the patient repeatedly insisted on the occasional involuntary closure of the right eye.

Kal. Iod., in rapidly increasing doses, was ordered. On the 30th of May, candle test revealed diplopia only in lower field: a lagging of the left eye in infraduction being clearly noticeable. On June 5th, notes show that in convergence the left eye everted at 15cm. Other conditions unchanged. On the 8th, when he was taking 55 grains of KI. t.d., diplopia was not noticed in any field, but was easily produced in the lower by a red glass. There was eversion on excluding either eye. Left pupil was still dilated, and contraction to light less active than in right. The falling off in this pupillary action of left eye was marked, P.P.A., R., 10cm., L., 33cm. On 16th, when his dose of KI. was 70 grains t.d., he could read Jaeg. 1 at a third of a meter with the unaided left eye. During these three weeks he had not developed tabetic symptoms. I have no note of his patella reflex, though, unless I have confounded him in memory with another patient under care at the same time, it was unimpaired. When he disappeared after the cure (?) of his eye troubles, I felt that he was a syphilitic with tertiary manifestations, and that sooner or later he would turn up somewhere with other deep lesions. I next saw him March 3, 1897. His gait, when entering the office, was unmistakable. He gave a pretty clear history of increasing trouble in walking, pains in lower extremities, etc. There was no inconvenience in eye work. I found the patella reflex abolished. The eye condition was: partly dilated left pupil, feeble response to light in either eye, but prompt to A. and C.; near point A. 10cm. each. No diplopia. At my suggestion, he consulted my friend, Dr. F. T. Miles, who found other characteristic tabetic symptoms. On July 2d, the fields were taken for the first time. They show scarcely any form contraction in the right and not excessive in the left eye. In each, however, colors are disproportionately narrowed.

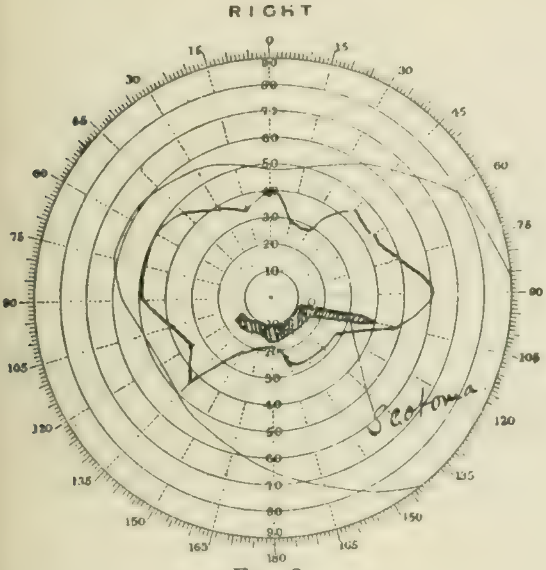

FIG. 3.

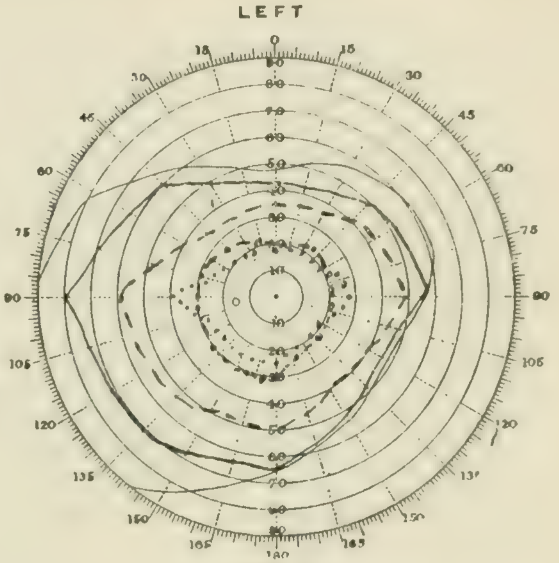

FIG. 4.

I have seen Mr. D. several times since. He is in active business, and seems, barring his ataxic gait (which does not prevent him jumping on a moving car, as

I saw a few weeks since), in perfect health. In October, 1897, when I made my last examination, the eyes presented the same condition, save that the left pupil was not as dilated as it had been, while rigidity to light, with action to A. or C. was present in both pupils.

There are several interesting points in this clinical history. It illustrates, generally, the possible far-reaching nature of what may appear at first as an ordinary paralysis of an eye muscle. Syphilis was assumed as a cause, and treatment instituted before its presence was admitted. And yet, the very rapidity of recovery, and the tendency of tabetic paralyses (even if they are also syphilitic—as Moëbius claims they practically always are) to spontaneous recovery, throw doubt on the effectiveness of the KI. Another point is the early mydriasis, with persistent pupillary action and impairment of A. It looks as though there was at first an irritative lesion of the dilating fibers of this, with an inhibitory of the ciliary muscle. The persistence of good vision, while the spinal symptoms rapidly developed, and the contraction of color out of proportion to form fields, correspond pretty closely with the observations quoted from Knies.

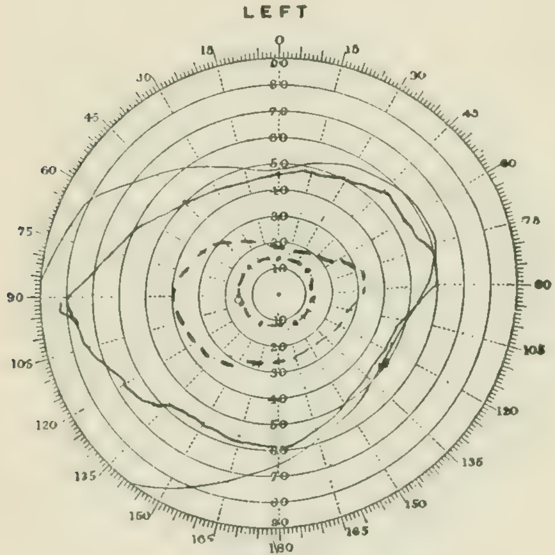

FIG. 5.

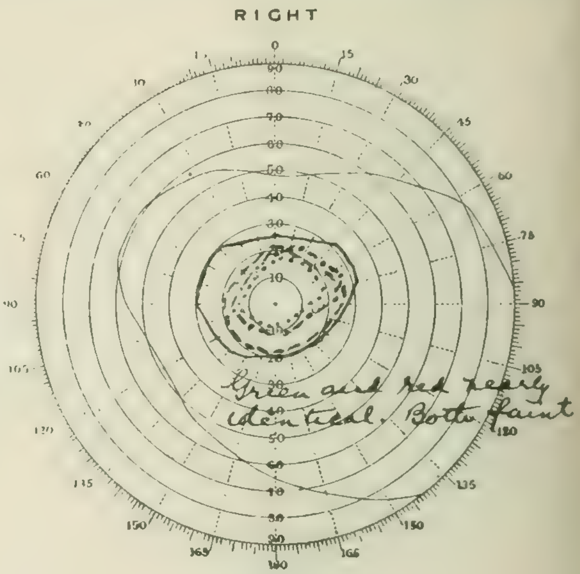

FIG. 6.

The fields, as taken in July, 1897, are appended. Figs. 1 and 2.

CASE 2.—UNILATERAL (LEFT) ACCOMMODATIVE PARESIS, PERMANENT. FOLLOWED IN FOUR MONTHS BY RAPID RIGHT OPTIC NERVE ATROPHY, PARACENTRAL SCOTOMA, AND A YEAR LATER (PROBABLY) BY COMMENCING ATROPHY OF LEFT NERVE. RIGHT MYOSIS; SLOW DEVELOPMENT OF ARGYLL-ROBERTSON PUPIL.—Mr. L., aged 38, merchant, living in eastern Maryland, consulted me October 15, 1895, for poor vision, specially in near work, in the left eye. There was no other symptom. He had no pain, and history was negative.

Apparently, he was in perfect health. External and ophthalmoscopic appearances were normal in each eye. Pupils were of normal size and reaction. Movements normal, and the phorometer showed orthophoria. Visual tests were: R. E. 20/30, made 20/20 by -0.5 D. Cyl., Axis 90°.

P. P. A., 13cm., Jaeg. 1 read by naked eye.

L. E. 20/40, made 20/20 by +0.75D. Sp.=H.m.

P. P. A., 28cm., Jaeg. 1 read only with aid of +1.50D. Sp.

As there was no asthenopia, and Mr. L. was averse to wearing glasses—indeed, said, after an hour's trial in the office waiting-room, that reading was more comfortable with naked eyes—no treatment was instituted. He was advised to call if asthenopia developed.

I next saw Mr. L. February 8, 1896. He now spoke of failing vision in the right eye. Visual acuity was reduced to 20/70. It could not be improved by glasses. Jaeg. 1 was indistinctly deciphered at six inches. Condition of left eye was unchanged, as were also the pupillary and muscular phenomena. There were no remote symptoms. Tendon reflex was not affected. His field was not taken, or, if it was, the chart cannot be found now. I tried again to bring out a specific history, but either accidentally, or designedly, the patient did not give it. The right optic nerve was white, and evidently becoming atrophic. He was put on increasing doses of strychnia, commencing with a twentieth, and running rapidly up to a fifth, three times a day, at which time he showed physiological symptoms. He was kept on this for three weeks. I then lost sight of him until the 8th of July. In the mean time he had sought the optician's advice, and was armed with three or four pairs of strong convex spher-cyls. His condition at this time was, right eye, V. 3/200, no near vision, and atrophy well advanced. The field was obtained with some difficulty. It shows (Fig. 3) an unusual condition in tabes: a paracentral scotoma. At the same time, the form field is irregularly narrowed. Color perception was entirely lost. The left eye was unchanged, save that a little more help was needed in reading: +2.75D.S. Field for form and color was unaltered. No general symptoms were noticeable. He now admitted

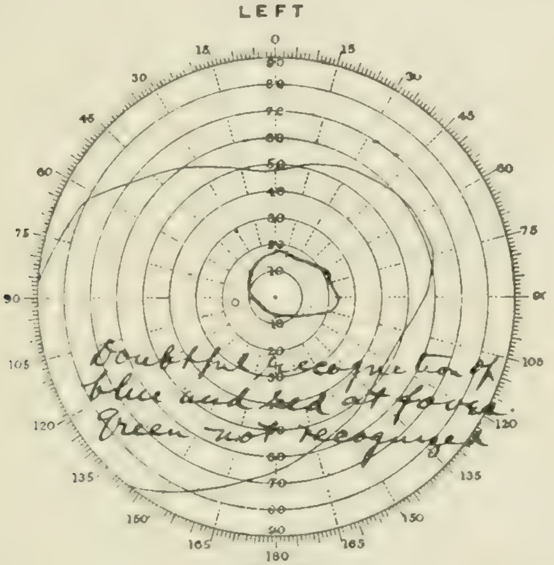

FIG. 7.

a probable syphilitic history, and was put on increasing doses of KI. This was run up to a dram t.d., in a short time, when I again lost sight of him, and his next visit to me was the 23d of March, 1897. The right eye had only l.p., and the nerve was in a condition of white atrophy. Visual acuity left eye was unchanged. There was now a new pupillary symptom: the right pupil (that of atrophic eye) was smaller than the left. It responded feebly to light thrown in the right, more promptly, when the left retina was illuminated. I thought, however, that consensual pupillary contraction to light was lessened in both eyes, even on left illumination. It was markedly less active than to accommodation. The left field showed narrowing for both form and color, greater for latter (Fig. 4).

Patella reflex was now found lessened. I sent the man to Dr. Miles, who reported the case as one of "undoubted tabes." He advised the rapid increase of KI to tolerance.

My last examination of the patient was July 23 and 24, 1897. The right had lost l.p., while the left eye still had 20/20 with +1D. Sp. He made some mistakes, and said it "looked hazy." The pupil was very small in the right eye, unaltered in the left. There was no light reaction in either eye, illumination of each being tried successively. Each pupil contracted to A. The field for the left eye showed color contraction since March. This, in connection with the 'haziness" in central vision, is significant of the future. Indeed, one could with little difficulty perceive pallor of the left papilla then. Patella reflex was about gone. Gait was unaffected.

I heard from Mr. L. in the fall of 1897. He wrote easily, and said his symptoms were unchanged. He was still taking KI. A dram t.d. is his limit.

CASE 3.—PARTIAL RIGHT PTOSIS, DAY BLINDNESS, NERVE ATROPHY.—While I saw this patient only twice, the symptoms are sufficiently characteristic and interesting to justify reporting the case. A. S., 27 years of age, consulted me May 15, 1897, for day blindness and difficulty in keeping the right eye open. Mr. S. was, and still is, I believe, a newspaper carrier. He said that, for a few months, as soon as the sun rose, his sight became dim. Light was not irritating. He was not conscious of much falling off in visual acuity. A partial right ptosis was apparent. Otherwise there was no defect in the extrinsic muscles. Both pupils were contracted and entirely immovable to light, though both became still smaller on A. and C. Functional examination showed:

R. E., 20/40, Jaeg. 1; L. E. 20/70, Jaeg. 11. Neither could be helped. Field examination showed practically entire loss of peripheral vision in the left, somewhat better range in the right. (Figs. 6 and 7.) There was advanced gray atrophy of both optic nerves. The only remote symptom I discovered was, as I thought, loss of the patella reflex. I sent the man to Dr. Henry J. Berkley for diagnosis, without reference to the eye symptoms. He found that the patella reflex could be brought out to a slight degree by having Mr. S. grasp tightly with the hand a ruler while the experiment was made. Upon the presence of several anesthetic areas and other symptoms, he pronounced the case tabes.

Doubtless the unfavorable prognosis drove the patient away from both of us. I heard a few months ago that his condition had not changed. There was clear history of syphilis.

It is not, I think, easy to explain the day blindness. It was insisted on as the only really distressing symptom. Mr. S. stayed in the house until evening, if the day was bright, because he could not see well enough to trust himself out of doors. Absence of central opacities in the media, of central scotoma, and of pupillary action to light excludes this common explanation of defective vision in a bright light. Quotation has already been made from Knies that the nerve elements of the retina undergo atrophic changes in tabes. Speaking directly of day blindness, he says: "This is observed when, for any reason, an abnormal amount of light enters the eye—or in imperfect pigmentation of the fundus oculi—and also in certain diseases of the retina and the optic nerve. In all these cases the efficient factor seems to be the insufficient restitution of the material employed in the act of vision, this being sufficient only when the action of the light is diminished. The diminished nutritive changes which have become habitual in those parts of the retina which are sensitive to light do not suffice in bright daylight."

These statements only put the cause of the day blindness in some unknown change in the photo-chemic properties of the retina, occurring in connection with atrophy of the retinal nerve elements.

842 Park avenue.

THE SCIENCE OF OPHTHALMOLOGY.*

BY DUDLEY S. REYNOLDS, A.M., M.D.

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OF LOUISVILLE.

The science of ophthalmology is in great danger of becoming tainted with loose methods of approximation. It is related of Friar Bacon, who invented spectacles, that he ground his own lenses. Keppler, to whom the world is indebted for many discoveries in astronomy, elaborated and simplified the methods of grinding lenses, and they came at once into general use. The original plan was based upon the idea that the maximum angle of refraction in a spherical body expressed the unit. The quadrant of the sphere being the unit, had its focal length in the radius, minus the interruption of the passage of light through the lens, this being great or small, according to the index of refraction of the media used for making lenses. If the radius of the sphere from which the unit was derived were twelve inches, the focal length of the unit would be twelve inches, minus the resistance of the medium to the passage of light. For spectacle lenses, the radius of the unit, it has been agreed, should be one inch, or twenty-five millimeters. Now, if we adopt the English inch, the French inch, or the Prussian inch, all of which are materially different, we should, of course, have the lenses in these systems made of fractional parts of the unit; and as this is the quadrant of a sphere, focal lengths would have to be measured by the same system of determining the radius; and so it was, in former times, the custom of the English-speaking people, the French, and North Germans, to employ systems peculiarly their own.

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*Read at the meeting of the Western Ophthalmologic and Otolaryngologic Association, Chicago, April 7-8, 1898.

In an attempt to popularize this branch of science, and to give it common characters which would be acceptable to all nations, the International Ophthalmological Congress of 1867, on motion of Professor Javal, appointed a committee to investigate the merits of the different systems of grading lenses, and report some method which should be universally acceptable. That committee fixed upon the plan of grading lenses by focal lengths, and established the meter as the unit of measure, and fixing the whole series required for a complete case of test lenses with definite inter-focal spaces. It had already been noted that, in the fractional system of gradation, although based upon the radius of curvature of the refracting surface, the lenses were required to exhibit uniform refracting power; and, as different media were employed for making the lenses, and different units of measure to determine their radii, constant disparity appeared in the results of their application. The eyes of persons having but slight errors of refraction, and especially in cases of astigmatism, refused to be comforted by the best directed attempts at correcting their refraction, and so Giraud-Teulon conceived the difficulty must be in the ocular muscles. He practiced decentering the lenses, and claimed great advantage from their use.

In 1868, Dr. Herman Scheffler concluded, from the favorable reports of the use of decentered lenses, that each lens should be made periscopic, n order to measure uniformly the whole outer field of vision. His work on the "Theorie der Augenfehler und der Brille" presents a thoroughly scientific analysis of the refracting powers of prismic, spheric and cylindric bodies, separately and in combination, in their varied application to the correction of errors of refraction in the eye.

Paetz and Flohr, of Berlin, practically abandoned the radius of curvature and introduced a series of test lenses graded by focal lengths, adopting the Prussian inch as the standard. The prismic base of each lens in the series constituted an orthoscopic combination. The prisms were designated in degrees, minutes and seconds, according to the angular deviation of the light passed through them. This, it was supposed, would yield such precisely accurate results in grinding lenses as to enable the optician to give each of them the proper periscopic form. Then it became necessary to still have recourse to the capacity of the eye to unite parallel rays of light in a uniform angle to determine at the same time the acuity of perception.

With the definite sized test letters of Snellen came a uniform distance for positive infinity, or parallel light. Now, if the Prussian inch determined the unit of refraction in the lenses, it is manifestly clear the Prussian linear measure must be employed to fix the point of positive infinity. As Snellen constructed his test letters at first upon the basis of English measure, it is natural that great dissatisfaction in France and Germany should have arisen upon the adoption of a system foreign to their own.

When the metric system of gradation was finally agreed upon, Snellen re-calculated the relations in the size of his test letters for the new point of positive infinity, fixed at six meters. However much we may incline to criticise the want of accuracy in methods of grinding lenses, and the merits of the meter as a unit of measure, we must allow that its adoption necessarily does away with a very large percentage of those errors incident to our former lack of uniformity in the units of measure.

Inasmuch as the distance at which the test object is placed for measuring the capacity of the eye to unite parallel rays of light has been fixed at six meters, and the relative acuity of vision is expressed in angular measure, it is manifestly clear that neither more nor less than six meters shall be employed to represent the distance, and that no other terms than those of the relative angle of visual perception shall be used to record the result. Neither vulgar fractions should be employed, nor any inharmonious system of notation.

Of the scientific toys designed to afford cheap and easy methods of evading the exacting demands of the details of a circumstantial analysis, not one of them can do away with the necessity for an accurately graded series of test lenses, the complete suspension of the accommodation of the eye to be tested, and the geometrically graded test objects, placed at the point of positive infinity.

It will not do to say that David O'Flaherty, with accommodation suspended in his right eye, sees with + 2.00 D = $\frac{1}{6}$ of normal; yet this is a good illustration of a very common mode of expression. A very valuable contribution on the clinical uses of certain cycloplegics is marred by the statement of a metrical lens required to secure vision = $\frac{20}{20}$.

The science of ophthalmology cannot be preserved in its concrete form if such matters as these escape our attention. It is not to be wondered that disappointment so frequently follows loose methods of analysis as to lead both patient and practitioner astray in searching for causes of pains and aches that refuse to yield to the supposed correction of errors of refraction.

The decentered lens and the prism have seized upon the minds of some, whilst others have apparently gone daft in their search for ocular tendons to cut, or advance. An enthusiastic surgeon has recently reported his achievements in the looping of ocular tendons with catgut ligatures. Our confrere, Dr. George T. Stevens, has created an apparently rational place for partial tenotomy; but it is not an uncommon occurrence to read of a dozen or more tenotomies, or advancements, of the tendons in a single eye. With the tendon looped, muscular coördination in the movements of the eyes might, in all probability, be expected to observe not alone the lateral, the vertical, and the rotary movements, but, like the famous gun with the curved barrel, made to shoot bears behind trees, turned in all sorts of irregular directions to compensate for the eccentricities of opposing tendons.

A fine illustration of the results of painstaking practice is presented in the person of Mrs. T., aged 30, the wife of a prominent practitioner in Louisville. She came to me on the 19th of October, 1896, with divergent squint, photophobia, indistinct vision for distance, and total inability to read. She had suffered almost continuously with sick headache for a long time, and having been told that the ocular tendons must be advanced, her husband brought her to me, with the object of having whatever operating found necessary, done at once. On attempting to suspend the accommodation, I found she had unsteady muscular movement, the rotary muscles being in an almost constant state of activity. Without glasses she saw nothing; with the glasses she had she saw 6/xxxvi, Snellen, with the right eye, and 6/lx with the left eye. On examination of the glasses, I found for the right eye she had— 0.75 c. axis 170° $\genfrac{}{}{0pt}{}{\frown}{\smile}$ — 0.75s combined with a prism of 3°, base inward. In the left eye she had + 2.00 c. axis 110° $\genfrac{}{}{0pt}{}{\frown}{\smile}$ ┌ — 3.50 c.

I prescribed homatropin drops to be instilled twice daily, and directed smoked coquilles to be worn constantly, and no attempt to be made to see objects, excepting for purposes of going about. She went to the country, and remained until April 30, 1897. When she returned, the eyes were re-examined, under homatropin, the use of which had been kept up during her entire absence. I found + 1.00 c. axis 90° enabled the right eye to see = 6/vi Snellen; + 2.00 c. axis 90° enabled the left eye to see = 6/vi— Snellen. These glasses were prescribed, and she has worn them constantly ever since. She is fond of reading, and, having no children, has spent the past year in almost constant reading, with not more than two attacks of headache during the entire year, both of these clearly due to indigestion. The glasses she had formerly worn were chosen after a most painstaking and thorough analysis with the Javal-Schiotz ophthalmometer, the ophthalmoscope, and the Zengrefractometer, in the hands of an experienced practitioner. It may be remarked that she narrowly escaped a series of tenotomies and advancements.

The great point to be considered is that sufficient care should be taken to establish complete suspension of accommodation, and no final attempt to determine the state of refraction should be made for persons whose general health is such as to disqualify them from engaging in the normal use of the eyes. Proper discrimination in these matters, and a judicious course of constitutional treatment necessary to restore the patient's general health, are too often overlooked, or neglected.

CATARACT EXTRACTION: VALK'S OPERATION.

BY FRANCIS VALK, M.D.

Professor of the Diseases of the Eye, New York Post-Graduate School and Hospital, etc., etc.

Illustrated.

The crowning operation in ophthalmic practice is the removal of the crystalline lens, for by this operation we at once restore our patients from a condition of more or less blindness to that of improved vision and usefulness; moreover, this operation is of so much importance to many of the human race, and of a condition to which all may be liable, that any procedure tending to relief is justifiable and worthy of earnest consideration.

Experience is an excellent teacher, though many times a sad one; yet, it may tell us very often what is best to do, and assist us in the selection of the best method of procedure. The first object or consideration the surgeon must have in mind is the ultimate good of his patient. To attain this he should lay aside all other considerations and make his decisions with that end in view. Under these conditions the surgeon must not only have a certain amount of experience, but should be familiar with all the methods that have been tried by other operators, in order to know and judge what will best succeed in the case before him for operation.

I do not think, at the present time, that any one procedure can fulfill all the indications, nor be suitable for every case. One operator will have good success by one method, while another may take a very different procedure and yet have the same final result. As we read the literature of the present day we find two methods for the extraction of the crystalline lens which seem to take precedence over all others, namely: The "combined method," and the "simple" operation; but as we find many strong advocates of each method, we also find many opponents of both.

By the "combined method" we eliminate the mechanical interference of the exit of the lens, yet on the other hand, we, at the same time, subject the eye to two very serious operations, either one of which, under certain conditions, is great enough to destroy the eye. By the "simple method" we do not operate on the iris, yet the iris is so pushed upon and forced out of the eye, and so freely manipulated that the dangers of the after-coming prolapse of the iris are so great that many operators have abandoned it and returned to the "combined" operation.

No operation can be free from all these objections; there is no middle path, nor is there any "Royal Road," but after several years' experience in the method to be described, I feel justified in again presenting it to the profession, especially since I am inclined to think that the objections to its use may be less than in either of the other two methods. All other procedures, such as the removal of the lens in its capsule, or that of the use of the knife alone, possess too many dangers to be followed or approved.

The operations for extraction which have received the approval of nearly all the members of the profession are of two methods: That of the "combined"—an operation that was at one time called von Graefe's, but only because his knife was used; and the "simple," or the old operation, which has been revived and almost universally adopted. I may also speak of my own method in this connection, to be hereafter described, which I claim is a combination of the advantages of the other two operations.

The technique of the "combined" or the "simple method" is familiar to all surgeons, each one presenting certain advantages, and each having its dangers. These dangers cannot be eliminated by any skill, experience, or care, for I firmly believe, from my own experience and that of others, that in cases of complete and distressing failure, the failure is due to causes existing in the individual operated upon and not to the fault of the operator.

In all methods for the removal of cataract and the restoration of vision, there are many similar points and procedures; but the chief aim and object of the operator must always be the selection of that method which, from all the indications, is likely to give the best and safest results to the patient.

Bearing this in mind, we must decide what operation to perform and the indications for a successful result. For example, a shallow anterior chamber would indicate that the section must be made small, and even then there will be more or less difficulty in the extraction of the lens by the "simple method," in which event we must change our plan of operation and remove a portion of the iris so as to take away this mechanical impediment to the exit of the lens. A sluggish movement of the iris, or any slight posterior synechia, would indicate an iridectomy before the exit of the lens; and after the lens has been removed, if the iris show any tendency to prolapse, it is best to cut it off at once, even if it can be restored to its place in the anterior chamber.

On the other hand, we may decide that a large cornea, a deep anterior chamber, and a clear iris, readily movable, are clear indications in favor of the removal of the lens by the "simple method," with complete success in the end; but at the same time there are other objections to this method that present themselves at the time of the operation, or after the healing of the wound. In the "combined method" I think the two great operations on the eye at the same time—the iridectomy and the extraction—renders the process much more dangerous and liable to infection or inflammatory processes that may ultimately mar the result; and then again, the coloboma, from the removal of a portion of the iris, tends to reduce the final results of vision from the admittance of more of the peripheral rays. In the "simple method," the force generally required,—even when most carefully applied—for the tipping of the lens in its fossa and expulsion is dangerous, and requires a very nice adjustment of that force; yet, a successful operation by this method gives results most devoutly to be wished.

All of these advantages, I claim, can be obtained, and all of these disadvantages can be eliminated by my method, but at the same time I cannot claim that it is free from all dangers and mishaps, as in no case can we prevent an incarceration of the iris, or a prolapse or possible infection of the wound. And the objection that it is another instrument introduced into the eye will not hold good in the present light of antisepsis, and the increased skill of the operators of the present day.

Since 1887, when I performed my first operation, to the present time, I have used this method in nearly fifty cases without the loss of a single eye; and the results have been very satisfactory, especially when it is considered that my cases were not selected in any way, and that I have attempted to operate on all in this manner, and did so, except where some accident, such as the patient forcing the iris against the knife at the time of the section, has prevented my following the steps that I had proposed in the beginning of the operation. In a few words, then, my object is and has been to have the advantages of an iridectomy without the cutting of that membrane and the consecutive coloboma.

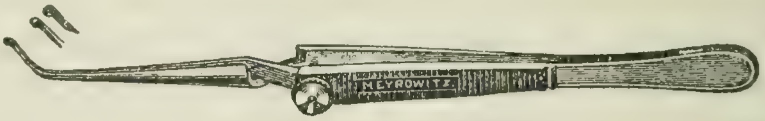
This operation has been presented in papers before the Clinical Society of the New York Post-Graduate School and Hospital, of the New York Academy of Medicine, and also before the Section on Ophthalmology of the First Pan-American Medical Congress, and I still continue to operate by this method, for it seems to me to fulfill the old injunction to operate "tuto, cito et jucunde," and the fact that this method has been copied by Dr. Pitts (see *Medical Record*, October 1890) gives it at least some merit, though Dr. Pitts does not give me the credit of holding the iris "tucked back" until the lens passes out, but does criticise my method, which speaks for itself.

I do not make my patients undergo any special preparation before the operation, except giving a mild purgative the day before. At the time of the operation the lids and brow are washed with a solution of boracic acid, but not the conjunctival sac, while the instruments are all cleaned with hot water, or if possible, sterilized. Nor do I dilate the iris with atropine before the operation, for I believe we can make a better section, with less danger of wounding the iris, when the pupil is normal in size; and then again, because the iris will always contract as soon as the intra-ocular pressure is relieved at the commencement of the section. For the same reason I do not put cocaine in the eye until about five minutes before I am ready to operate.

It is my firm belief that on the section of the cornea depends, in a great measure, the success of an operation, as a perfect section, properly made, will rapidly heal. I never make the conjunctival flap, as I consider this process would endanger the final result, and render hemorrhage very liable to obscure the field of operation. It might tend to prevent prolapse of the iris, but I am not convinced of it yet by my own experience; consequently, I make the section to include about two-fifths of the periphery of the cornea, and so as to have the puncture and counter-puncture in the clear corneal tissue about one millimeter from the limbus. An incision of this size will be sufficient for the extraction of the lens in all cases, and I doubt very much if any operator can tell the relative size of the lens before the operation. In making my section, I have followed the method suggested by DeWecker, and it should be nearly completed before the anterior chamber has emptied itself. This section is made with the knife by three clean and distinct cuts in this manner: After the point of the knife has made the counter-puncture, it is carried rapidly forward and upward, thereby cutting one side of the section; the knife is then drawn backward and upward, cutting the other side of the section; at this point the knife is near the periphery of the cornea, and I now turn it slightly on its axis, and complete the section by cutting outward with one clean cut.

When the section is made in this way we have clear, sharp edges that will approximate perfectly, closing the wound at once; and at the same time the portion of the cornea at the upper part will leave room for the iris when tucked back, while in the vertical meridian it will act as a support for the arch of the cornea, and prevent any slipping of the edges of the wound and prolapse of the iris. In a few cases, particularly if we have a very shallow anterior chamber, we cannot follow this procedure, and it may be necessary to make the section by the to-and-fro movement; but such a section makes a wound in the cornea that cannot approximate readily, nor can it heal so rapidly. I still prefer, in the next step, to do a peripheral capsulotomy by passing the cystotome inward to the center of the pupillary space, and then as the point turns downward it is passed gently beneath the edge of the pupil and swept around to an extent of about one-half of the circumference, corresponding with the section in the cornea. This section of the capsule requires great care and accuracy in the adjustment of the cystotome, and calculation as to how far it shall pass under the iris; but it has never failed in my hands to give me a swift and ready exit of the lens. Nor have I yet met with any cases in which the anterior capsule was so thick that the forceps were required to tear it away, while the question of a final needling remains to be settled after the operation. At this point in the operation I depart from the usual steps, and proceed to follow out my method of extraction of the lens, in which I claim that I have the advantages of the "simple" and the "combined method." Hence my next step in the operation is the drawing back of the iris, and holding it "*tucked back*" behind the scleral edge of the section until the lens begins to pass outward. This procedure is performed by the use of my *Iris Retractor*, as shown in the illustration, and I believe that I was the first to use this method in the extraction of the lens. Dr. Knapp, in the "Archives of Ophthalmology," March, 1888, page 60, states that he has drawn back the iris toward the periphery when he found that membrane somewhat rigid, using the small wire loop in order to facilitate the exit of the lens; and the same method seems to have been adopted by Dr. Pitts in the *Medical Record*, October, 1890, three years after I published my first paper, wherein he describes a method of operation by drawing back the iris with a similar wire loop, and holding it there until the lens passed out by pressure on the lower part of the cornea. In the same paper Dr. Pitts criticises my retractor, when, according to his own admissions, he has never seen my instrument, nor does he even know its construction, but has simply followed out my ideas, and drawn back the iris while the lens is being removed. His method and my own are practically the same, but the wire loop is a much more dangerous instrument in the eye, because it cannot be removed quickly in case of any sudden movements or loss of vitreous, while the retractor can be instantly removed, and does not take up any more room than the wire loop.

The construction of this little instrument is very simple, as is shown in this illustration—having two small knobs on the ends of a pair of iris forceps with crossed action. These little knobs stand at right angles to the axis of the ends of the blades, and point downward when in position, and hold the iris tucked back in the superior space until the lens passes into the corneal wound. As the lens rises the iris is released by tipping up the ends, and the lens is found lying in the concavity of the blades.



Dr. Valk's Iris Retractor.

The simplicity with which this step in the operation is performed, the rapid and natural return of the iris to its position without further manipulation, the slight pressure required on the lower part of the cornea, and the freedom from any danger of infection renders this instrument extremely useful in the hands of a skilled operator.

To continue the steps of our operation: "The eye is now ready for the extraction of the lens, and is grasped by the fixation forceps directly opposite the section, and held steady by a careful assistant. I now take the retractor in the left hand, and with the blades closed and the set screw so arranged that the blades will open to about the diameter of the pupil, I insinuate the ends through the section to the pupillary space. The blades are now opened by pressure, and the iris drawn back and tucked beneath the edge of the corneal section. Holding it steady in that position, a slight pressure is made on the opposite side of the cornea with a spoon or hook, causing the lens to rise up and easily pass out over the ends of the blades. As it does so, and as soon as the lens presents itself at the section, the retractor is pushed slightly inward, which at once releases the iris. The retractor is then generally removed with the lens lying in the concavity of the blades. As the lens clears away, we find the iris back in its position, not injured in any way, nor has it been exposed to the air, as may occur in simple extraction. In case there should be any cortex remaining, which I do not think will be absorbed or will interfere with the vision, I have reintroduced the retractor, and, drawing back the iris again, these masses are easily pressed out with a spoon.

This completes the operation, and the section being in perfect apposition, the speculum is removed, the eye gently closed, and the bandage applied. It is not my purpose to discuss the different methods of the after-treatment of an operation for cataract. Each operator will have his own method, from that of the old days when we kept the eyes bandaged and the patient in a dark room for more than a week, to that of not closing the eye, even with the strip of plaster; and I have no doubt that the statistics will show as good results for one as for the other. But I do feel that if the eye is protected and kept quiet until the section is healed, that results will be safer and better for the patient; so, while our first consideration may be the ultimate success of the operation, our next should be the comfort of our patient as the healing process proceeds.

Under these circumstances, it seems to me that if we close both eyes with pads of cotton and a neat-fitting bandage, there will be less movements of the eyes, and consequently less pressure on the eyeballs by the straight muscles. The slight restraint of a day or two in bed will not cause any distress, while the rest and quiet will assist in the rapid healing of the wound. Hence, I keep my patients in bed for two days, and then allow them to sit up during the day, and remove the bandage from the eye not operated upon at the end of forty-eight hours. After this, the bandage is changed every day, and the lids washed with warm water, until the tenth day, when the eye is examined.

I am inclined to think that the less we interfere with our cases, the better will be the final results; nor can I see any advantage in opening the eye until the tenth day, provided, that the appearance of the lids and the absence of pain or discomfort seem to indicate that the healing process is proceeding satisfactorily.

I have seen prolapse of the iris occur on the sixth day after the operation; and have had incarceration of the iris that I felt was due to too much interference with the healing of the wound.

But, if from any cause we may suspect that all is not going well, as redness of the lids, pain, scratching sensations, restlessness, etc., then we must not hesitate to open the eye and endeavor to correct whatever complications we may find. The use of atropine may stop a commencing iritis, or in case of prolapse we may treat it as seems best from the indications, either let it alone or cut it off, according to the extent of the prolapse.

If the operation of cutting off the prolapsed iris is necessary, I have found that cocaine will fail, and it is advisable to give ether, so as to have perfect command of the work.

In a series of fifty-seven operations for cataract, having in consideration the best interests of my patients, I have been compelled to lay aside the use of the retractor in nine operations, and use the "simple" or the "combined method;" and it has been only in these cases that I have been so unfortunate as to have any complete failures, while in all the others—now forty-nine operations, in which the retractor was used—the subsequent process of healing has been satisfactory, and the final results all that could be expected, if not better than the average.

146 E. Thirty-seventh Street, New York City.

THE USE OF SUPRARENAL CAPSULE IN MINOR EYE SURGERY.

BY JOSEPH A. MULLEN, M.D.
OF HOUSTON, TEXAS.

For the amelioration of pain and the prevention of bleeding in minor eye surgery, I desire to offer some observations of my own as well as others confirmatory of those reported by Dr. W. H. Bates* on "The Use of Extract of Suprarenal Capsule in the Eye."

The principle upon which its physiological action depends is the contractile power of the extract upon the arterioles, a vaso constricting action, thereby retaining the absorbed cocaine and increasing its contractile and anesthetic properties.

It reduces the extra-ocular tunics to a state of ischemia, preventing hemorrhage and maintaining anesthesia by keeping the cocaine locked within the tissues. Locally applied it is never followed by any constitutional manifestations, but when given hypodermatically it is, however, attended with dangerous symptoms. The face becomes livid, and there is great pain in the chest and head. These untoward effects are unmistakably due to the action of the suprarenal extract upon the small arterioles.† It also decidedly increases blood pressure.‡ According-

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**N. Y. Med. Jour.*, May 16, 1898.

†Op. Cit.

‡This fact knowingly or unknowingly has been clinically utilized by Mankowski (*St. Peter's Med. Woch.*, Oct. 30th), who recommends that a solution of the extract always be on hand at chloroform narcosis. He chloroformed dogs until the circulation and respiration had ceased. Thirty seconds afterwards he injected a solution of the extract into the jugular vein, restoring them to life. (*Jour. Amer. Med. Ass'n.*, Feb. 5, 1898.)

ing to Drs. J. J. Abel and A. C. Crawford,* the blood-pressure-raising constituent is an active sulphate, a pyridine base or alkaloid.

The preparation I use is from the suprarenal capsule of the sheep, and dispensed to the profession as a powder by Armour & Co.

The solution is made by dissolving grs. v. in dr. i. of cold saturated boric acid solution and filtered. Fresh solution should be prepared for each operation. It keeps very poorly and soon becomes foul smelling. Locally its action is purely one of contraction; it enhances and prolongs the contractile effect of cocaine, after which solution it is always used. The solution is not at all irritating, but rather imparts a cooling sensation to the conjunctival membrane. A solution of cocaine 5 per cent. in strength is instilled in the eye and allowed to remain for ten minutes, after which the solution of suprarenal capsule is put in also, and in fifteen minutes the surface is ready for operation, i.e., when complete ischemia has taken place. As is well known, cocaine produces on mucous surfaces a contraction of the capillaries, while the extract of suprarenal capsule increases its action to such an extent that when the tissues are incised no hemorrhage occurs, while without the extract bleeding takes place and the anesthetic effects of cocaine pass away with the flow of blood. The action of the suprarenal on the arterioles is further supplemented by contraction of the sub-conjunctival connective tissue pulling the membrane down upon the sclerotic, preventing, even if the hemorrhage be slight, the extravasation of blood beneath the conjunctiva.

These physiological effects materially increase the clinical usefulness of the extract. It bleaches the vessels in the ptygerium and conjunctiva, making the line of demarkation between the two quite distinct, isolating the former so its removal is readily accomplished. It, however, does not immobilize the tissues so that the suturing becomes difficult. It also greatly lessens secondary swelling, and in some unknown manner kindly influences more rapid healing, so that the sutures may be taken out earlier and the parts returned to their normal.†

When using the extract for tenotomies proceed the same as in removing a ptygerium until the capsule of Tenon is reached, then instill more cocaine solution, after which the suprarenal capsule is used as before. In this way repeated testing of the muscle can be made until sufficient has been cut off for the purpose indicated. It is surprising, when proceeding in this manner, the ease to the operator and comfort to the patient with which the tenotomy is attended, and especially is it advantageous, as there is very little hemorrhage or pain.

Johns Hopkins Hospital Bul., No. 76, July, 1897.

†See article by author, "The Clinical Observation on Use of the Aqueous Extract of Suprarenal Capsule in Operations Within the Nasal Chambers." *International Clinics*, January, 1898.

The swelling after excision of ptygerii and tenotomies seems to be milder than when cocaine alone is used, especially when cracked ice is applied to the parts after the operation. When operating on the drainage apparatus of the eye, cocaine solution is first instilled into the conjunctival sac, and then a small quantity of the same solution is injected into the lachrymal sac and nasal duct. This is followed by a similar instillation and injection of the extract. Fifteen minutes after the canuliculus can be opened and the stricture of the nasal duct incised. The operation is almost bloodless and painless—a decided improvement over the use of cocaine alone. Its advantages over the use of cocaine alone are: First, to increase the anesthesia of cocaine; second, it, with cocaine, produces ischemia of the mucous tissues; third, in some kind way it modifies post-operative swelling; fourth, materially enhances rapid healing of the parts. I have never seen any evidences of cocaine toxemia when the extract had been used.*

These advantages are quite valuable, and should entitle the suprarenal capsule to a confident place on our list of medicinal substances for use in the eye.

The astringent action lasts from one hour to an hour and a half, and is followed by no injurious effects to the cornea, etc. The extract does not cause dilatation or contraction of the pupil, and is devoid of any action on accommodation; and, with Dr. Bates, I believe that within the limits of its sphere of activity, there is absolutely no other substance which can take its place in minor operative procedure on the eye and its appendages.

*Op. Cit.

A new 1898 DeZeng Refractometer for sale cheap, for cash. Address, 304 Dayton Bldg., Minneapolis, Minn.

EDITOR OF THE OPHTHALMIC RECORD.

I notice in your March issue a "Preliminary Statement" by Dr. Wm. E. Baxter of Boston, concerning a method of testing the oblique muscles. While the method of using Maddox rods for that purpose may be new to Dr. Baxter, I wish to claim priority in using Maddox rods in testing the obliques, since I have used them in a special instrument daily in my office for nearly two years, and had my perfected instrument constructed nearly a year ago by E. B. Meyrowitz in New York.

Yours very truly, EDWARD P. BREWER, M.D.

18 Washington St., Norwich, Ct., April 9, 1898.

REPORTS OF SOCIETIES.

WESTERN OPHTHALMOLOGIC AND OTO-LARYNGOLOGIC ASSOCIATION.

(*Continued from May Number.*)

Dr. Dudley S. Reynolds, of Louisville, Ky., read a paper on *The Science of Ophthalmology*, which appears in full in June RECORD page 285.

Discussion.—Dr. Wescott asked how many examinations are necessary before getting satisfactory results, and how is the homatropin used. Experience lead him to believe that it makes some difference as to how we use it in patients of twenty-five or thirty-five as to the results obtained. When an opportunity is given to repeat, day after day, his examinations for errors of refraction, he does not get the same results on different days, no matter how careful he is in the first examination. Atropin is used wherever possible, and he endeavors to have the patient come day after day, using a one per cent solution of sulphate of atropin two or three times a day until results are constant. He has come to be dissatisfied with his work until the last two examinations correspond. Dr. Wescott uses homatropin hydrobromate and cocain hydrochlorate, ten grains to the ounce, with one grain of salicylic acid to the ounce of sterile water. The patient introduces a drop of this solution in each eye every five minutes, and waits an hour after the first application; the amount of the refractive error is then determined with the ophthalmoscope. He uses the Risley optometer in all his work. The homatropin cases are examined a second time on the next day if possible, but one test has frequently to be depended upon.

Dr. J. E. Colburn, of Chicago: With young children, atropin is the only cycloplegic that Dr. Colburn feels any confidence in getting a result from, and two or three examinations are always necessary for a successful correction extending over a period of four or five days. With those who are trained to close observation, homatropin, used much as Dr. Wescott has suggested, gives him good results. But he is careful to examine not only once on the same day, but two or three times. If the patient can be induced to remain within control, he makes two or three examinations under a cycloplegic an hour or so apart. When the patient is unable to give up two or three days for examination, then, if possible, he has them return for an examination on the second or third day, having stopped the homatropin, giving them the benefit of an after-examination after the pupil has contracted and the eye has resumed its functions. Then, if the patient will accept all of the correction, he is ordered it. If he will only accept a part of the correction, that is ordered with the understanding that he is to return again for further consideration in case he has any annoyance. We must consider the personal equation in these cases. A dilated pupil does not give the accurate refraction that a contracted pupil does, so that we have to consider other things in order to arrive at accurate results. Then, too, our results are going to be modified largely by the habits of patients, their habits in using atropin, the position in which they hold their eyes in reading or writing, and their occupation must be considered in giving correction. With the use of homatropin, Dr. Colburn is never certain that he is getting accurate correction, and simply uses it under protest. In the use of atropin, if properly applied and long enough, he feels, after two or three examinations, that he can get great improvement. Dr. Colburn uses, in young children, a solution of four to six grains to the ounce of homatropin, it depending largely upon the age of the patient. In the case of an adult he would use it as Dr. Wescott has stated, in combination with cocain.

Dr. A. E. Prince, of Springfield, Ill., has for ten years used a solution of homatropin in the proportion of five per cent, which is stronger than is usually recommended, adding to it a two per cent solution of cocain, not enough to disturb the epithelium, but enough to diminish the irritation of the homatropin. It requires some judgment in using homatropin in the case of children and adults. At the ages of ten years or younger, five drops of the solution are used at intervals of five minutes; at the age of twenty years, four drops at intervals of five minutes. When properly used, the same results are obtained as from the use of sulphate of atropia. His patients are re-tested with the use of sulphate of atropia, with no better results than previously found with homatropin.

Dr. Frank Allport, of Chicago, is a firm believer in the efficacy of homatropin in almost all cases. He has used homatropin in a four per cent solution for a good many years, and has rarely been disappointed in its use. He does not usually graduate the amount of the solution with the age of the patient. After a patient has passed the age of forty, more care is exercised in the use of the cycloplegic. He was not satisfied with a two per cent solution of homatropin, and increased it until now he is using a four per cent solution, which he is quite satisfied with. A drop or two is placed upon the cornea every five minutes for half an hour, making about six applications in forty-five minutes. After the last application, the patient is considered ready for examination. Dr. Allport thinks the best effects are obtained by having the patient throw his head back, and then pulling up the upper lid and dropping the solution on the cornea itself. For the last two or three years he has been using the homatropin discs recommended by Dr. Casey Wood and prepared by Wyeth. He gets better results from the use of these discs than from homatropin in solution. A disc is placed in each eye, and the eyes are kept steadfastly closed for twenty minutes; then another disc is introduced, and in forty-five minutes from the introduction of the last disc the patient is ready for examination. When it comes to making an examination under the influence of a cycloplegic, we must be guided by the general deportment of the eye. If the examination with the ophthalmometer, upon which he does not place a great deal of reliance, and the test lens are harmonious, he feels that the refraction has been properly worked out. If there are any discrepancies, or if the patient expresses doubt in the use of the different lenses from time to time, or if they are not exact in their answers, or if they cannot tell you exactly what spherical or cylindrical lens they wish, or if they are not accurate in their axis, or there is difficulty in adjusting the axis, or the patient's accommodation is not properly paralyzed, then a solution of sulphate of atropia is used.

Dr. W. F. Coleman, of Chicago, is decidedly of the opinion that homatropin is not sufficient to completely paralyze the accommodation in clinical cases. If you say, in a physiological subject, yes, and that position was taken by Oliver, who has done more work with cycloplegics than any man he knows of. Oliver was criticised for the position he took in regard to homatropin, in answer to which he stated that he never relied upon homatropin in his clinical cases. What proof have you that homatropin completely paralyzes the accommodation? Not one could give proof except to say the results were satisfactory in correcting the error of refraction. We are perfectly astonished in hearing patients say with what glasses they have comfort. But the question is, Do we paralyze the accommodation with homatropin? To satisfy himself on this point, Dr. Coleman made a series of experiments in one hundred cases about five years ago. He put patients under a solution of homatropin in the proportion of from eight to twenty grains to the ounce, four times in an hour, and proceeded to examine them shortly thereafter. His results were practically these, that not in more than one eye in twenty did he get full paralysis with homatropin. The variation was as much as ¼ D. in spherical error, and as much as ½ D. to 1½ or 2 in the cylinder. The axis was frequently different under homatropin. Dr. Coleman does not rely upon the ophthalmometer. It is probably correct in eighty per cent of the cases, but most of us rely upon the test lens as a last resort.

Dr. L. R. Culbertson, of Zanesville, Ohio, has used homatropin in the strength of two to six per cent with ophthalmic discs, and in about one-half of his cases in testing afterwards has found that the accommodation was not entirely relaxed. In recent years he has used the salicylate of atropin in connection with ophthalmic discs, which give a correction of about ½ to ¾ D., less than that found by retinoscopy, even stronger than that found by homatropin, and the majority of cases gave satisfaction. In recent years he has used the salicylate of atropin where the patient could spare the time to have atropinization. The salicylate has the decided advantage over the other salts of atropin in that it does not undergo changes with time. He uses Merck's salicylate and retinoscopic discs, and even if there is what he considers to be full paralysis of accommodation, he prescribes a glass according to the retinoscope disc that is spherical.

Dr. A. Alt, of St. Louis, uses the homatropin solution in the proportion of about sixteen grains to the ounce, but has found it to be extremely irritating to many patients, producing nausea in some and fainting spells in others, but in a number of cases did not succeed in getting the full cycloplegic effect. He has homatropin on his office desk, and uses it when he cannot keep a patient for any length of time and cannot use atropin, telling the patient it may be sufficient or insufficient. The question arises, Is it always necessary to have a cycloplegic effect in order to give the patient proper glasses? He has become more and more accustomed to the habit of allowing his patients to come back after the effect of the cycloplegic has passed off, and prescribing glasses that are most comfortable after reading in his office for two or three hours. Even though he prescribes weak glasses, he tells them that after a while they will be able to accept a stronger glass. He thinks patients are much more satisfied, and it is an excellent thing for them to become accustomed in learning how to use full correction for astigmatism, as well as hypermetropia, than to be worried for one or two months, and then be satisfied. They are better satisfied if they will take a stronger glass later on.

Dr. A. E. Bulson, of Fort Wayne, Ind., has always used homatropin very thoroughly; but the discs manufactured under the formula of Dr. Casey A. Wood have been preferable, and has used them every five to ten minutes, and instead of using four in an hour has used from six to eight in an hour and a half. He supposed that he got complete suspension of accommodation or a cycloplegic effect; but during the past year several patients whom he had previously examined returned, and were examined under atropin, finding that the effect of homatropin used at a previous examination had not been all that he supposed it was. He has used homatropin in many'hundreds of cases, and he was a staunch advocate of it for several years; but does not believe that it is applicable in all cases, as Dr. Reynolds maintains. He fully believes that in seventy-five per cent of the cases it is sufficient, but that in the other twenty-five per cent it will utterly fail in its purpose. We too frequently prescribe a glass that is too strong for the patient and decidedly uncomfortable. He believes this is a very sad mistake in a large number of cases, and that the patient, instead of being benefited by the glasses, and instead of wearing them, will lay them aside on account of the discomfort in becoming accustomed to them. He was criticised very severely for a paper presented at one time to the effect that he gave partial correction in cases of hypermetropia, and was accused of being half-way in his treatment; nevertheless he believes this half-way treatment in some cases is far preferable to giving patients the full correction. He would, therefore, strongly condemn the practice of giving full correction when a patient admits that it is too uncomfortable for first wearing.

Dr. C. Barck, of St. Louis, Mo., said that the older he gets the less frequently does he use cycloplegics. He would like to say a word or two in favor of a method which has not been mentioned to-day, namely, the direct ophthalmoscopic examination. In a large number of cases the accommodation relaxes entirely in the dark room under examination with the ophthalmoscope. This is all right if the examiner can relax his own accommodation and can rely upon his own relaxation. The younger members of the profession do not use this method as extensively as we do, simply because retinoscopy is easier to learn for the beginner. It would be a good thing if this method was practiced more. He never uses cycloplegics in patients above 40 years of age, but uses it in persons between 25 and 40, and uses it most frequently in children, and especially in those cases where there are indications of spasm of the muscles of accommodation. In the latter instances he prefers the use directly of atropia instead of homatropin. In young persons glasses will be rejected, and we must be guided by the age of patients, and in this connection referred to the table of Hirschberg.

Dr. B. E. Fryer, of Kansas City, Mo., does not believe that in the majority of cases we can get complete paralysis of accommodation with homatropin, and agrees with what Dr. Colburn has stated regarding its use, because we cannot get patients to wait long enough. Scopolamin is a satisfactory cycloplegic, and it does not dilate the pupil under its full effect so much as it acts on the ciliary muscle. We have a minimum, so to speak, of dilated pupil, and a maximum of cycloplegic effect. One other point, he thinks, is important. In giving people glasses, it is very essential to find out their muscular conditions and to make the lenses center. We may produce a distressing condition from improperly centering the lens. He uses one-fifth of one per cent solution of scopolamin, dropped into the eye two or three times. Occasionally you may get a toxic effect in young people, but care should be taken that it is not used too strongly.

Dr. Reynolds (closing the discussion): Dr. Reynolds has a fresh solution of homatropin make-up each time he is going to use it in the proportion of one grain to the dram. No cocain is used with it. The patient is brought into his office and a drop of the solution is dropped into each eye, the upper lid being raised and the solution allowed to fall upon the cornea; this is done about every minute, until ten applications have been made. Then, at the end of forty-five or fifty minutes, he begins the test with the use of Risley's optometer. An obscuring opaque disc is used for the purpose of covering one eye, insisting that the patient keep both eyes wide open. The patient is made to read what he can with the uncovered eye. If he can read down to about the fourth line from the bottom, Dr. Reynolds concludes that about 1 D. and ½ + hypermetropia is present. If that does not correct the error of refraction, he is asked to read the last line of the card backwards; then Donders' opaque disc is placed before the eye. It is placed vertically, and the patient is asked what he sees. If there is no discrepancy at all, he looks through the center of the slot. Then a series of lenses are prescribed, always preferring to begin with something the patient will require, and after having made an analysis of the refraction, he is able at once to determine whether there is suspension of accommodation. If the patient can see apparently as well with one glass as another, he is sent back to have the solution dropped into the eyes three or four times more, and after thirty minutes the test is again made. In about ninety per cent of the cases, homatropin, when used in the manner as suggested, will answer the purpose. It can be used in too great strength, and the interval after the last application can be too much extended, or you may approximate it. In persons whose accommodation is thoroughly paralyzed by the first series of applications of drops, and in many other persons in whom it has to be repeated, in something like ten per cent of the cases after thirty years of age, it becomes necessary to prolong the applications from day to day, or substitute for homatropin, sulphate of atropin, and he has scarcely determined in his own mind which is the better plan. Sulphate of atropin does not always succeed. It utterly failed in his own eyes. It develops irritation, which prevents suspension of accommodation. Sulphate of atropin is not an universally accepted cycloplegic. Homatropin, used in the manner stated, comes the nearest to fulfilling all requirements. He finds in persons above sixty years of age there is still considerable accommodative power present. In his own eyes he had no manifestation of presbyopia. Within the past year he has been obliged to add a spherical plus lens to his cylinders 3¼ D. axis 90° combined with ¾ D. sphere. Dr. Reynolds has never had constitutional manifestations from the use of hydrobromate of homatropin in children. In young ladies he has occasionally had serious nervous disturbances following its use, but the element of hysteria was too conspicuously apparent to justify the suspicion that the effect was due to the drug. He has known four grains of sulphate of atropia to the ounce of distilled water produce toxic effects in a robust adult, not once, but many times. It flushes the face and quickens the respiratory movements. These symptoms pass off after a while, and when the acute manifestations, with disturbance of the cardiac and respiratory centers, have passed away, then the cycloplegic effect is supposed to be present. He has no occasion to make any change in the strength of his solution, or to follow the method of varying the strength of the solution, as between children and adults, excepting in persons above forty, in whom there is no strong hypermetropia. He directs the applications to be limited to half a dozen instead of ten, about a minute apart. His experience with the use of cocain is that it frequently gets into the fauces and produces discomfort and sometimes alarming symptoms, and renders the cornea more or less opaque. It is, therefore, objectionable. The question of correct adjustment of the lens is of much importance. He has had great difficulty in past years in getting frames made with deep enough nasal curve on the one hand, or large enough at the base on the other hand, of the proper form to enable the patient to wear them in a fixed and constantly satisfactory position. Dr. Reynolds is opposed to partial correction of the error, excepting for those who have hypermetropia and hypermetropic astigmatism. He requires the patient to read with glasses with united parallel lens, they using any modification they please for distance.

Extraction of Immature Senile Cataract. By C. Barck, of St. Louis, Mo.—The current view of the necessity to wait for the so-called maturity of senile cataract needs to be modified. The lens, after the age of 55 to 60, is coherent enough, no matter how small the opacity, to admit of a complete and easy delivery, if the corneal and capsular sections are large enough. This opinion was first promulgated by Hirschberg, of Berlin, in 1892, but bitterly opposed. The experience of the author, based upon dissections and operations, coincides with the teachings of Hirschberg. He reports ten cases of extraction of immature cataract in different stages, in each of which the operation was just as easy and complete as in mature ones. The conclusions of the paper are; (1) A senile lens, however small the opacity may be, is coherent enough to admit an easy extraction *in toto* by the proper method; (2) to wait for the so-called maturity is unnecessary. The operation can be performed as soon as the sight is impaired to such a degree that the vocation or comfort of the patient is interfered with; (3) all operative procedures for artificial ripening are unnecessary and are contraindicated, exposing the eye to a twofold danger.

Discussion.—Dr. A. Alt, of St. Louis, agrees with Dr. Barck in regard to the possibility, and sometimes even the moral, demand, of extracting immature cataracts, and in a number of cases has extracted these cataracts that were more advanced. The first case in which he extracted an immature cataract was in a man fifty-nine years of age. He operated on him with success, and he returned to his business. He is fully in accord with Dr. Barck, that in people of from fifty-five to sixty years of age immature cataracts can be extracted very nicely, sometimes as perfectly as a mature one without leaving any substance behind. In some cases he has had better results from the extraction of immature cataracts than if he had waited longer. The patients are usually younger, are healthier and more active, and the recuperative powers are greater.

Dr. Dudley S. Reynolds, of Louisville: The subject of extraction of immature cataract is one of great interest. He has a professional brother who has had a zonular cataract for many years in the left eye. The entire posterior surface of the lens seems to have been opaque for more than a year, while in the anterior portion of the lens there is a little opaque matter limited to the anterior fold. In the nuclear part of the lens is a mass resembling a snow-ball in whiteness, surrounded by normal transparent lenticular substance. The question arises, Shall the lens be extracted? As you know, in many cases of lamellar cataract the capsule participates. We have capsular opacities before the lens is involved by the opaque change. He thinks that as long as a person has the capacity to read with the fellow eye, it should be let alone. The moment he is not able to read with the other eye, an extraction should be performed, with the understanding that almost certainly a subsequent needling operation of the opaque capsule might be safely undertaken. He would not care to extract such a lens through a dilated pupil, but would prefer to supplement it by an iridectomy. In the extraction of immature cataracts, whether zonular or nuclear, the operation should not be done through a dilated pupil, because it is certain that a large amount of cortical substance of the lens may be present in the capsule, or attached to it. No harm will result if the amount of it is not large, and if the eye is protected by an iridectomy. He is sure that if this be not done there will be some harm done to the ciliary region, and bring on an attack of glaucoma, and a glaucomatous attack after the extraction of an immature cataract is a dangerous complication. It will not occur if the extraction is preceded by an iridectomy.

Dr. Barck (closing the discussion): As to iridectomy, he stated that in all of his cases an iridectomy has been performed, and he has never gone so far as to remove an immature cataract without an iridectomy.

Multiple Angio-Sarcoma with Metastasis Into the Orbit and Other Regions. By H. V. Würdemann, M. D., of Milwaukee, Wis. Female æt. 5 years 7 months. Family history good, excepting grandfather, on maternal side died of carcinoma of the stomach. Personal history good, excepting intestinal indigestion due to ill-advised feeding. Was first seen in October, 1897, with considerable exophthalmos of left eye, down and out, caused by an irregular growth at upper and inner angle of orbit, which was nodulated and gave evidence of fluctuation; lid was slightly ecchymosed; ophthalmoscope showed only slight congestion of retinal veins. No evidence of diplopia; vision not obtained. Physical examination showed nothing else abnormal. Growth removed, consisting of a dark cystic mass the size of small walnut; was friable and subperiosteal, exposing denuded bone; wound healed rapidly, all evidences of exophthalmos and strabismus disappearing. Was seen again in December; eye protruding more than before, an enlargement at left temporal prominence, and one at junction of sagittal and coronal suture on right parietal bone. The right hypogastrium protruded, and a tumor of liver was thought to have appeared. No complaint of pain was made; was disturbed only by indigestion. Ophthalmic examination of eye showed nothing; no diplopia was discovered. Unfavorable prognosis was given and child sent to Children's Hospital. Weight, 30 pounds; temperature, 99.6; pulse, 120. Fed per rectum on peptonized milk for three days. Temperature became normal and pulse 100. Then was fed by mouth. Mental condition good. Blood count showed 3,500,000 red; white in proper relation. 0.30 gm. of potassium iodid was given three times a day in milk, without disturbing the stomach. January 3d had muscular cramps in legs at intervals, lasting three days; no complaint of pain otherwise; on general diet, with good appetite. February 10th, weight 32 pounds; abdomen large, body cachectic. Played with dolls, and noticed everything. Solid food refused; milk and ice-cream taken in small quantities; vomited easily; food apparently unchanged. Left eyeball became inflamed, vitreous first becoming turbid, then cornea opaque, rapidly softening; dressed with moist 25 per cent. glycerin and boric acid dressing. February 17th, weight 32 pounds, abdominal growth and tumors on head and in orbit greatly enlarged. Cornea sloughing slowly. Temperature 98 to 99; pulse, 100 to 120. February 23d, died after a short period of unconsciousness. Post-mortem: Tumor size of egg on left frontal prominence, one size of orange on right parietal bone; left eye pushed forward and down between lids by tumor size of a lemon in orbit. Tumor occupying epigastrium, right hypogastrium and part of left hypogastrium, extending as high as fifth rib on right side; body extremely emaciated. Organs in thorax normal; left kidney normal; right imbedded in mass of tumor. Superior portion having two indented facets produced by pressure; rest of kidney normal. Super-renal capsule surrounded by mass which was cystic and degenerated in its neighborhood; spleen normal, but pushed upwards; jejunum, ilium and large intestine normal; liver, stomach, duodenum, pancreas, mesenteric glands and aorta all massed together. Liver flattened to 3 cm. in thickness, and closely adherent to superior portion of neoplasm. Main growth covered by peritoneum is lobulated, attached to gall bladder, lesser curvature of stomach, mesenteric border of duodenum and connective tissue surrounding aorta. Common duct greatly elongated; walls of stomach and duodenum not thickened; pancreas much enlarged and connected with a cyst at its head filled with whitish semifluid. Frontal tumor firmly attached to skull, periosteum destroyed. Parietal tumor covered with periosteum, dura firmly attached to calvarium under tumors. Bone tissue destroyed. At anterior base the gyrus rectus, lobus olfactorious, gyrus frontalis inferiors destroyed and softened on the left side as far as fissure sylvius, and 2.5 cm. into frontal lobe. Gyrus rectus and lobus olfactorious partially destroyed on right. Brain otherwise normal. A tumor firmly attached and involving roof of left orbit and dura mater; bones forming the rood partially destroyed. Left eye surrounded by grayish-white tumor size of large walnut, filling whole of orbit. Optic nerve enlarged. Lachyrmal gland enlarged about ten times its size and black in color. Right eye normal. All evidence indicates neoplasm began in connective tissue of right kidney and extended upward into the liver, the surrounding tissue becoming involved by metastasis. Microscopic examination shows typical angio-sarcoma in all involved organs.

Discussion.—Dr. A. Alt, of St. Louis, Mo., was somewhat astonished to find that Dr. Würdemann does not consider the orbital tumor the primary one. Usually in these cases the orbital tumor is first, and the others are metastatic tumors. As long as there were no physical signs of disease of the abdominal organs when he first saw the case with orbital tumor, and unless there are good grounds for believing that the original seat of the tumor was in the abdominal cavity, it seems to him the orbital tumor was, after all, the primary tumor. Every one who has had opportunity to see such cases of orbital sarcoma knows that it is useless, so to speak, knowing the final outcome of these cases, to operate, unless by examination of the orbital contents we are able to remove all of the diseased tissue by an early operation. He has reported a case similar in nature, in which he operated on a primary tumor in the orbit. He thought he would be able to remove all of the diseased tissue, and yet within three months after operative interference a large tumor recurred, and at this time he refused to operate. The patient then went from his hands into those of a Christian Science healer in St. Louis, and he has been informed that a short time thereafter metastasis occurred in the abdominal organs and the patient died. So far as his acquaintance and knowledge with these cases go, usually the seat of the tumor is the orbital tissue, and the tumors which develop in the abdominal cavity are secondary tumors from metastasis.

Dr. Würdemann (closing the discussion). This case is probably unique, because of the angio-sarcoma appearing in a very young child, and also that it appeared in the connective tissue back of the kidney, rather than in the connective tissue elsewhere in the body. He has had another case of small round-cell sarcoma, non-pigmented, in which the eye was enucleated for inflammation, with no other diagnosis having been made. The patient, a lady 51 years of age, was brought to him later with a tumor having developed in the orbit, about the size of an eyeball.

Total exenteration of the orbit was done, and at the time there was no involvement of the glands, the liver or any other part of the body. The optic nerve was divided close to the commissure, and it cut like celery. At the microscopical examination, cells were found infiltrating and involving the edge of the optic nerve. Recurrence did not occur in this case for two and one-half years. The disease finally recurred in the liver, and was found in practically all the lymphatic tissue of the body. Recurrence took place in the orbit, but in the glands close by the tear duct. The patient finally died of inanition. The cause of death in the child was meningitis.

Dr. A. R. Amos, of Des Moines, Iowa, read a paper entitled *Hemianopsia, Followed by Total Loss of Vision in Both Eyes as a Result of Uterine Hemorrhage from Fibroid Tumor.* A woman, aged 50, who had always enjoyed good health previous to the onset of a uterine hemorrhage, which occurred nearly a year prior to any visual defect. No history of syphilis or tuberculosis, and no inherited tendency to brain disease. The uterine function had always been satisfactorily performed. During the period from the first hemorrhage to the complaint of visual defect her system had sustained frequent losses of blood from the uterus. Examination of central vision showed it to be above 20/30 in both eyes. The perimeter revealed a full field on the left in both eyes, as well as good color-sense, but visual perception from her right field was abolished. The pupil reflex and accommodative power were retained. Ophthalmoscopic examination negative. No apparent paralyses of other nerves. The patient was irritable and fretful. The extreme pallor of patient caused inquiries as to hemorrhage. Suspecting uterine tumor, the patient was at once referred to a surgeon with the assurance that the eye affection resulted from loss of blood. Accordingly, she was operated on by Dr. Etheridge, of Chicago, shortly after which vision remained about the same as when the essayist had last seen the patient. Within three days following the operation she was again attacked with dizziness, and became totally blind. In closing, the author called attention to the following points: 1. The two lesions occurring at different periods of time, and involving the same portion of each cerebral hemisphere—double homonymous lateral hemiopia. 2. While at first there was loss of central central vision as well as peripheral, regeneration of the area connected with the macula lutea of one or both sides had taken place, leaving the other areas still implicated.

Discussion.—Dr. L. R. Culbertson asked Dr. Amos whether he tested the light reflexes on each half of the retina, and whether it was a dark light reflex or a reflex on each lateral half.

Dr. Amos (closing the discussion): In reply to Dr. Culbertson, said that the light reflex following the first attack, namely, when he found the homonymous hemiopia, was tested in the dark room, the light being projected only on the blind side, or that part of the field of vision that was found to be sightless. In this test the pupillary reflex was found to be present. There was double homonymous hemiopia even at the time he first saw her, although no history of central vision was given. The pupillary reflex was present to light placed before a window, and seemed to be perfect.

Dr. L. R. Culbertson, of Zanesville, Ohio, read a paper on *Rotation of the Axis of Astigmatism During Ophthalmometric Examination*, and reported three cases.

PRESENTATION OF CASES, MICROSCOPICAL AND PATHOLOGICAL SPECIMENS, AND NEW INSTRUMENTS

Dr. A. Alt, of St. Louis, Mo., showed under the microscope a tumor affecting the ciliary process, accidentally found in the eye of a patient who died from pneumonia. He discovered in the other eye the same kind of tumor, affecting another ciliary process. The nature of the tumor he was not sure about. It looks, at a superficial glance, as though adenomatous, but on examining it with a high power one sees a number of spindle cells arranged in double rows, and between them a gelatinous substance something like the tissue of the umbilicus. It resembles a gumma, but probably is not one, because there is no small cell infiltration around it; perhaps it is a congenital tumor.

Dr. Alt showed under a low power a number of cells of trachoma, which he considers the parasitic organism which causes this disease.

Dr. Alt also showed a section of lamellar cataract nucleus.

Dr. Casey Wood, of Chicago, presented four surgical cases—the first as a problem, and asked the advice of the association as to its treatment. The first symptom that the patient, a strong, healthy man, aged 47, with no constitutional disease, manifested was that of unilateral neuralgia, apparently supra-orbital, which was very severe and lasted for many months. Patient was treated by different methods without any beneficial result. A short time before the orator saw him an abscess formed immediately above the eye, and broke through the skin a little to the outer side of the region of the supraorbital notch, and a fistulous opening has since persisted. Following the breaking of the abscess he got some relief from the supraorbital neuralgia. Dr. Wood found the remains of an eccondrosis of the septum opposite the center of the middle turbinal bone, which had been operated upon quite recently, and although it gave him some relief so far as the nasal symptoms were concerned, had not been removed sufficiently early to relieve the patient's distress or prevent the lesion under considation. From the fact that there was long continued, unilateral, supraorbital pain, followed by orbital abscess which, on discharging, gave relief to the symptoms, Dr. Wood believed that he had to deal with empyema of the frontal sinus. Before seeing the patient the sinus and the abscess behind had been treated by all sorts of solutions and powders without avail. Following the advice of Kuhnt, an incision was made in the central line, following the nasal crest; another, continuous with this but at right angles to it, followed the brow. The skin and periosteum were turned back, exposing the bony parts at the internal angle, and with a large trephine the frontal sinus was entered. Pus flowed out, some granulation tissue was found in and removed by the curette from the frontal sinus. This opening was kept free as long as possible, was frequently irrigated, and then packed with iodoform gauze. A retro-ocular abscess now remains. The fact that the patient lost the other eye years ago rather complicates matters, as one naturally hesitates to do certain things that he would feel like doing if the patient had two good eyes. In attempting to heal the abscess a large aneurism needle was passed through the sinus, deep behind the globe, and brought out a little more than half an inch towards the nose, a counter puncture being made at the latter site and a large drainage tube inserted. This was retained in place as long as possible, but healing apparently taking place from the bottom, the drainage tube was eventually removed. The patient still has a slight, occasional discharge from the opening, but not very much. His symptoms are entirely relieved, but still this leaking keeps up. It is not reasonable to expect in this case complete closure of the fistulous tract inside of three or four months. If not cured then, Dr. Wood proposed to reopen the frontal sinus and drain the latter through the infundibulum.

Removal of the lens for high myopia. — Removal of the lens for high degree of myopia is not as common an operation in this country as it doubtless will be, and it is not for obvious reasons, as frequent here as in Germany. The case exhibited is probably the first operation done in this country, having been reported in the discussion of Dr. Harlan's paper before the *American Medical Association* some years ago. "The case is as follows: March 2, 1891, A. M., seamstress, seventeen years old, been myopic for eight years, lately getting much worse. Could not go to school, and now unable to do any sort of work. If she attempts to sew, her eyes ache, and feel as if they were bulging out of her head. Glasses make objects brighter, but do not otherwise help—V. R.=fingers at seven feet, with —14 D.=20-100. Skiascopy confirms this finding. V. L.=fingers at eight feet, with —15 D.=20-70. There are sharp temporal crescents of about ½ d. d. in width in both eyes. No choroiditis, although the choroidal vessels can be readily seen over the whole background. Macular regions show as cherry red spots. March 3, 1890, needled the right lens, a small central opening. Used atropin and hot water to relieve subsequent pain. In a week, tension with pericorneal injection and pain. Made a corneal opening and removed most of the lens. Did two subsequent needlings. August 5th, V. R.=20-100. The pupil is irregular and attached to pupillary membrane. In December needled left lens without mishap. The lens absorbed nicely, V. L.=20-100. With L. 90°+.50+4=20-50, and with 90°+.50+8=J2. Did not order lenses for right eye, although with this correction on left side patient was able to read and do other near work and eyes were comfortable. I did not see her again until March of this year, when the following condition was observed: Secondary cataract, V. R. fingers at 5 and no improvement. Left membrane needled and with 90°+.75+2.50=20-50, and 90°+.75+6.50=J2. Two weeks later did a De Wecker's capsule-scissors operation, after which patient obtained 20-50 vision and could read J2 and do near work without trouble."

The improvement in this patient's case has gone on until now she has no trouble whatever with her eyes. She has no headaches or pains, and is able to use her eyes indefinitely for all kinds of work.

In connection with this case another was shown—a case of monocular myopia of 13 D., with marked asthenopia. This healthy girl's (æt. 16) left eye is practically normal, but in the right eye there is a high degree of myopia. The elongated axis on the right side can be seen very easily as the patient looks to the right. What is one to do in such a case as this? Glasses have not been of any use at all. Both partial and full corrections have been ordered, and all sorts of treatment given, and still she is practically unable to use her eyes for more than a few minutes at a time. The myopic eye shows no destructive fundus lesions. No relief followed the wearing of glasses. There was no relief from non-operative interference. The fundus is practically normal, and there are no choroidal changes to speak of. In operating on this patient all precautions were taken. Although limited in experience of these cases, Doctor Wood agrees with Fukala that one should be very careful about the first needling. He had trouble in the first case where, owing to want of care, fully one-half the lens came forward into the anterior chamber. The first discission in the second instance was done six days ago, and although one can see small shreds of the lens projecting into the anterior chamber, there has been very little reaction.

Surgical Treatment of Anterior Synechiæ.—Anterior synechiæ, whatever their origin, are, as a rule, in this country left alone. In a certain class of cases, where it is possible to interfere successfully and easily, Doctor Wood uniformly cuts through the incarcerated iris, and exhibited a patient, a child, for the purpose of showing the usual procedure in such cases. Where there is a space between the synechia and the iridic angle he has been in the habit of separating the iris from the cicatrix, close to the cornea, by means of Lang's "twin" knives. One is a blunt-pointed and the other a sharp-pointed bistoury. The sharp-pointed bistoury is entered in the true cornea near the limbus, as far away as possible from the site of the synechia, and when withdrawn no aqueous is lost. Through the opening thus made the blunt-pointed bistoury is carefully introduced, passed behind the imprisoned iris stretched across the anterior chamber, and the latter abscised. The operation is simple, and because of its simplicity should be more generally practiced. In this case the penetrating wound of the cornea tore a portion of the iris, so that there was an opening through the mass of the iris itself, and quite a large portion of the torn piece presented through the cornea. Having dealt with the case in the manner described no reaction whatever followed, and the present state of the case is certainly much better than if the synechia had been left.

In answer to Dr. C. D. Wescott, Doctor Wood said that he had never used these knives in cases of complete occlusion of the pupil, although he had seen Lang do such an operation with success.

An Operation for Partial Advancement.—In the patient presented the operation was done on the left external rectus. She had marked esotropia, with red-glass diplopia, vertigo, etc., and was able to fuse a candle light at twenty feet for a few minutes only. A needle armed with a singlebraided-silk thread is passed beneath and through the lower edge of the tendon as near the cornea as possible and firmly tied with a double knot, leaving a suture end two inches long. It is then passed beneath the conjunctiva for a distance of 3, 4 or 5 mm. (according to the effect desired), along the lower border of the muscle, and out again through the conjunctiva. The needle is now carried into and out of the body of the muscle (through capsule and conjunctiva) until it reaches the superior border of the rectus. It is then carried along this border to a point opposite the original knot, and hence, as before, across the muscle (or tendon) to the point of starting. The patient is told to look outward as far as possible, the suture is drawn taut, and the purse-string operation is complete. Doctor Wood advises the simple procedure in most cases where a partial advancement is indicated. There is usually little reaction, and no section of the tendon opposing, although resort to this additional procedure may, of course, be had. Four weeks ago the eye presented a decidedly bloodshot appearance after the operation, but at present it looks well; the visual result is excellent, and the ocular symptoms have disappeared.

In reply to Doctors Coleman and Colburn, he said that he would do this operation in almost all cases where one would not do section and advancement at the same time, but where one could reasonably expect to get some results from advancement alone. In answer to Doctor Alt, he replied that the suture may be left in ten days.

Dr. J. E. Colburn said that some years ago, at the Cincinnati meeting of the American Medical Association, he reported an operation similar to this, and devised a double hook for raising the muscle, being sure that he had the muscle in grasp while making the operation, as the Doctor has done; but although he had made a few such operations and obtained good results, the reaction was so great in some of the cases, and the recovery so slow, that he made up his mind that advancement with section was the preferable procedure. He never went further than to call attention to the operation at that time.

Dr. J. O. Stillson, of Indianapolis, Ind., said that he saw Doctor Jackson do an operation for excessive myopia similar to the one described by Dr. Casey Wood, the case having been presented to the Philadelphia Medical Society. Doctor Jackson passes the needle in not far from the limbus to the center of the cornea, making a small capsular incision. This allows the lens to come forward, and, using the cornea as a fulcrum, and without enlarging the opening in the capsule, makes extensive trituration of the lens inside the opening. After triturating the lens well he withdraws the needle, and in this way gets more rapid absorption without the risk of allowing the soft lenticular substance to come out into the anterior chamber. The aqueous is secreted very soon, and the anterior chamber is re-established, so that he does not get, as he claims, any great amount of irritation or reaction. The results of this and other operations were very gratifying. Dr. Charles H. Beard, of Chicago, always does discission with a small Graefe knife, not with a needle, entered near the sclerocorneal junction. In making one's first needling, Doctor Wood is quite right in saying that one should not attempt to do too much; merely prick the anterior capsule. The Graefe knife is of great advantage over the needle from the fact that one can make a slanting incision, barely lifting up the capsule with the point of the knife, and quickly withdrawing it. Afterward, when it comes to another needling, one may enter more boldly, and insert the knife deeply into the lens substance. Certainly the old method of needling, by means of Bowman's needle plunged through the cornea, is a very dangerous procedure. I would do this operation with more fear and trembling than make a cataract extraction. I have seen serious results from needling by Bowman's needle, because by so doing little shreds of the capsule are easily drawn out into the small opening made by the needle, which serve as foci of infection. Dr. David W. Stevenson, of Richmond, Ind., had, in China, done about a dozen of these needling operations for high myopia, and reported the case of a patient so treated who obtained useful vision, although his refraction was —18 D. A large proportion of the Chinese are shortsighted, because the print is so bad, and oculists who wish to do this operation can have many opportunities of doing it in China. He frequently used the suction apparatus to hasten the matter somewhat after needling. Dr. A. Alt, of St. Louis, Mo., had performed a number of these needling operations, and placed on record one or two cases. One of these was a man who was utterly unable to do near work with or without glasses. He had compound myopic astigmatism. The first case operated on turned out beautifully, so that the man had normal vision. His astigmatism disappeared after the operation, and he read with a +3 D. With a comparatively weak spherical lens he could do all near work. He was a young man, so that previously he could not go to school on account of the condition of his eyes. He had no education to speak of, but was eager to get one. With one eye vision was so good that he went to school and prepared himself for business, which he is now carrying on. About nine months after this he came back and asked to be operated on in the other eye, which was affected by choroidal disease and dislocation of the lens. This time too thorough needling was done, and the eye was ruined by detachment of the retina. Dr. E. A. Kegley, of Cedar Rapids, Iowa, reported the case of a young man, twenty-three years of age, who came to him wearing a 16 D. concave glass. He had been trimming osage orange, and had been injured in the eyes by one of the thorns, the lens becoming opaque. It was needled three times, and within six months he began to pursue his studies in college without the use of any glass.

Dr. Casey Wood, in closing the discussion, agreed with the remarks of the various gentlemen regarding needling, and did not think it was quite such a simple operation as it is usually considered to be. It is regarded as a trifling procedure until one gets a serious reaction following it, and probably a lost eye. He prefers to use a needle in this operation, but a needle that closely resembles a small, thin Graefe knife. It is very important in this operation not to trifle too much with the lens, and he remarked that the lesson he received in the discission of the first eye for excessive myopia was one that he had not forgotten.

A Case of Optic Atrophy Following Injury Much Improved by Electricity.—Dr. W. F. Coleman, of Chicago, presented the following case: Mr. B., age 61 years, was struck by a piece of scantling, forty-five pounds in weight, on the forehead, in August, 1896, rendering him unconscious for ten minutes. He resumed work in a week, but felt a sense of intoxication in his head. Two weeks later he fell from a wagon and struck the back of his head but was not rendered unconscious. He has had thirteen children, ten of whom are living. His wife had one miscarriage from overlifting. He gives no history of syphilis or other disease. Has had no cerebral or spinal symptoms. Smokes three pipes a day since eighteen years old; takes one glass of liquor a day. The field of vision, taken four months after treatment began, showed concentric contraction for each eye of 10° in the whole field. Color vision: The right eye confuses purple with gray and gray with blue. The left eye confuses purple and green with gray and gray with blue. Before treatment. Vision right eye = fingers at twelve feet slowly. Vision left eye ditto. Fundi showed advanced optic atrophy of the temporal side of both discs. The choroidal pigment was thinned on the temporal side of each disc. The retinal vessels appeared normal. Treatment: He was treated for three months at the *Illinois Eye and Ear Infirmary* by strychnine injections and internal medication, but vision continued to fail. The diagnosis, as told the patient, was optic atrophy. Prognosis unfavorable. For a month previously was treated at the *Hahnemann Hospital.* Diagnosis and prognosis the same. Treatment: The patient has been treated at Doctor Coleman's clinic, the *Post-Graduate Hospital.* Galvanism has been used for five minutes daily, the cathode to the closed lids of each eye, and the anode to the nape of the neck with a current of 5 m. a. After four months' treatment: Vision, each eye = 6/18. With + 4.50s each eye = .05 Sn. at 10 to 14 inches. The discs show much more color than at the first examination. Doctor Young, of Zanesville, Ohio, thought it would be well for members of the association to examine the eyes of Doctor Coleman's patient. Personally he failed to see on what basis a diagnosis of optic atrophy has been made, inasmuch as there was no appreciable diminution in the caliber of the blood-vessels, and no cupping.

NOTE.—The patient has not applied for or recovered damages on account of the injury at any time after the beginning of the treatment. We state this so as to exclude the psychological effect of improved finances upon the vision.

Discussion on Dr. W. A. Fisher's case of *Bilateral Abducens Paralysis*, published in the May number of the OPHTHALMIC RECORD.

Dr. A. R. Amos, of Des Moines, Iowa, did not think it necessary to assume that paralysis of the abducens is the primary cause of the position of the eyes, since a force sufficient to draw the eyes in and hold them as they are now being held would be sufficient to overcome antagonism of the external recti. Even a contracture of the external muscle would hardly account for the condition that is present, and one must account for it rather on the basis of contraction of the fibrous envelopes of that region. The slight ptosis which is present might be present with this condition at the same time. The external recti are paralyzed from long continued stretching, and with the weakness incidental to the paralysis the eyeballs drop forward. It is a process not unlike that which takes place in chronic diseases of fibrous connective tissue elsewhere.

Dr. Thomas Faith of Chicago, showed a *Peculiar Case of Paralysis of The Ocular Muscles* in a man aged 51, unmarried; nationality, Belgian; family history, negative.

Previous history: When nine years old patient had epidemic dysentery; malaria at the age of thirty. He had gonorrhea at fourteen; has had enlarged glands in the groin at times. Indefinite history of some skin trouble which recurred several times, but disappeared always on taking a brisk cathartic. Had a sunstroke in 1894, which has incapacitated him for hard work, particularly in warm weather. History of eye trouble: Has central leucoma in both corneæ, which has been present since the patient can remember. Has had a tendency to divergence in the right eye for the last seven or eight years, which has grown gradually more marked since 1894, the time of the sunstroke, up to 1896, since which time it has remained stationary. Patient has some evidence of having had syphilis, namely, some cervical adenitis, and what appears to be the remains of a mucous patch in the mouth. Present condition is, paralysis of the internal rectus, superior rectus, inferior rectus, and superior oblique of the right eye. The eye remains, when at rest, in a position of divergence. If directed to look to the left, the eye can only be brought inward as far as the median line. Comparing it with its fellow of the opposite side, and directing the patient to look downward, it is seen to fall behind. The same is true when he is directed to look down and to the right; but when he is directed to look up, instead of the eye moving directly upward, it moves up and to the right, which is easily done when the patient is directed to look in this direction, showing that the inferior oblique and external rectus are the only muscles which are acting. The lesions causing the paralysis in this case is difficult, if not impossible, to locate.

In the case under consideration we have the fourth nerve involved, the branch of the superior division of the third, which supplies the superior rectus, and the branches of the inferior division, which supply the internal and inferior recti, the third branch, or that going to the inferior oblique and ophthalmic ganglion, being unaffected. It does not seem probable that it is a central lesion, from the fact that we have no paralysis of the inferior oblique, no paralysis of accommodation, no dilatation of the pupil, and no ptosis, though Meyer states that if the cause is situated in the central parts or near the origin of the nerve, the disease must be very extensive to involve all the fibers of the nerve, and paralysis of the fourth being present in the case, favors the theory of central origin.

The above points would tend to indicate that this case is one of chronic ophthalmoplegia of central origin, though the lesion may be a peripheral one, and Dr. Faith has thought of the possibility of it being due to some periosteal inflammation, growth or gumma along the inner wall of the orbit, near the apex, and causing pressure upon or involving the four muscles which pass nearer to the inner than to any other wall of the orbit, and are the muscles which are here involved. Whatever may be the location of the lesion, the paralysis is surely a peculiar one, and is probably due to syphilis, as benefit has been obtained from the use of iodides. Dr. Robert Tilley, of Chicago, said the patient informed him that he was perfectly well before he sustained two accidents, one in the front of the head, and one on the back part of the head. The injury in the back part of the head, as he described it, seems to be situated in what is supposed to be the cortical region for vision, and there is a marked depression in the skull. It is always interesting to try and find out, if possible, something regarding these injuries. Dr. Tilley had seen so many cases where atrophy of the optic nerve followed injuries about the head. There is undoubtedly the appearance of atrophy in the left eye, on the temporal side.

Dr. H. V. Würdemann, of Milwaukee, showed two specimens mounted in formalin-gelatin, one of albuminuric retinitis, and another of hemorrhagic glaucoma. Some of the specimens shown had been in gelatin for several years, and were still in a good state of preservation.

Non-Pigmented Sarcoma of the Choroid.—Dr. Cassius D. Wescott showed a patient whose history is as follows: In August, 1896, Goldie C., aged four, of Madison, Wis., was referred to him by Dr. H. B. Favill, of Chicago. After an attack of measles, when two-and-a-half years old, it was noticed that she could not see with the left eye, and "something white" could be seen in it. The child had made no complaint of pain until a short time before being brought to Dr. Wescott, and her general health seemed to be quite perfect. She had been under the treatment of a specialist in Madison for a year, but the nature of the treatment could not be learned, except that "drops" were put into the eye. On examination the right eye was found to be quite normal in every way. The left eyeball was evidently larger than its fellow, but the lids were normal. The conjunctiva was not inflamed, but it was slightly edematous, and the sub-conjunctival vessels, especially the veins, were fuller than normal. The cornea was normal, but the pupil was fully dilated and the iris pushed forward by the lens, which was almost in contact with the cornea. There was a yellowish reflex from the pupil as the eye was examined in an ordinary light, and the tension of the eyeball was +2. No pain was complained of at the time of the examination. The diagnosis was intraocular tumor, probably glioma of the retina, and the eye enucleated. Upon section of the eyeball, after hardening in formalin, the tumor was found apparently springing from the choroid in the region of the optic nerve head. It extended forward to the posterior surface of the lens, separating to some extent the choroid from the sclera, apparently infiltrating the choroid and retina in places as far forward as the ora serrata. Microscopical examination showed the tumor to be a small round-celled sarcoma, springing from the deeper layers of the choroid and infiltrating the retina and optic nerve. A section of the optic nerve at the point of amputation showed that the tumor cells had infiltrated the substance of the nerve beyond that point, and it was therefore expected that the tumor would return. In May, 1897, the patient returned with a new growth nearly filling the cavity of the orbit. It was immediately removed by complete exenteration of the orbit. Healing was prompt and uneventful, but in August of the same year the growth had again returned. Further operative procedure was advised against, and instead a trial of the erysipelas toxins was suggested, which was made by Doctor Van Hook, at the German Hospital, but the treatment was without avail and the patient died December 27, 1897, with symptoms of brain tumor.

No autopsy could be obtained. This case is of interest chiefly because of the rarity of this form of tumor as compared with glioma of the retina.

Primary Carcinoma of the Conjunctiva in a man, a farmer by occupation, sixty-four years of age, who had enjoyed good health until within the last year, since when he has been rather feeble and somewhat demented. Five or six years ago a small tumor was removed from his face, which was called a cancer. Between two and three years ago the present trouble began as a spot of redness upon the upper and outer part of the eyeball. The spot soon assumed the form of a pimple, and continued to grow much more rapidly during the last few months. The right eye was normal; the lids of the left eye were normal, but it was impossible to close them because of the presence of a somewhat lobulated tumor, projecting over the cornea. The eye and tumor were bathed in a muco-purulent discharge, and the apex of the tumor was apparently beginning to slough. The tumor was unpigmented and covered by a thin, membranous, transparent capsule, beneath which a few large vessels were easily seen. Immediate enucleation was advised, and consented to. The operation was performed without difficulty, but was very bloody. The retrobulbar conjunctiva above was involved in the tumor, and was removed. The tumor was otherwise limited to the globe, and no secondary growth was found in the orbit, and the neighboring glands did not seem to be involved. Upon examination of the specimen the eyeball seemed to be normal and the cornea clear, the tumor evidently growing from the conjunctiva upward and outward from the limbus. At the thickest point the tumor was 1 cm. in thickness, somewhat oval in shape, perhaps 2 cm. wide and 2½ cm. long. Microscopical examination of the tumor was made by Prof. Ludvig Hektoen, director of the laboratories at *Rush Medical College.* His report is as follows:

"The interior of the eye seems normal, also the optic nerve. The right antero-lateral quadrant of the globe is covered by an oval, concavo-convex growth, which appears to spring from the conjunctiva, to which it is attached throughout. The sclera and the cornea under the tumor are intact. The tumor overlaps the cornea to beyond the middle line, but there is no marked organic connection between the two. The tumor is 8 mm. thick, its longest diameters 2.5 and 2 cm. Its margins are rounded, in places a little lobulated. On the cut surfaces it presents a grayish-white, almost homogeneous appearance; a few small blood-vessels are recognizable. Microscopical examination shows that the tumor springs from the epithelium of the scleral conjunctiva. The sub-conjunctival tissue, the sclera and the cornea are intact. The tumor consists of huge branching masses and columns of epithelial cells, separated by a vascular fibrous tissue in which there is an abundant round-cell infiltration and a few hemorrhages. The epithelial cells are in the main large and flat; at the periphery of the masses the cells at times assume a short columnal outline. The nuclei often lie in vacuoles in the clear protoplasm, which may have a narrow, dense hyaline border. A few atypical horny masses are met with. The diagnosis is Carcinoma of the Scleral Conjunctiva."

Multiple Lymphoid Tumors of the Orbits in a man about fifty years old, a grocer by occupation, who complained of failing sight in consequence of tumors about the eyeballs, had been steadily increasing in size and number for some months, during which time he had also failed in general health and had lost over fifty pounds in weight. The lids of both eyes were normal, except that they were bulged forward, owing to the presence of firm and somewhat nodular tumors beneath them. The cornea and iris were normal in both eyes and the media clear, and when the lids were raised by the fingers vision was good, but the presence of the tumors made it impossible for the patient to raise either of the upper lids fully above the pupils. The conjunctiva was not inflamed, but its vessels, especially the veins, were much fulled and larger than normal. The diagnosis of multiple sarcoma was made and concurred in by Prof. F. C. Hotz, and the patient advised that operation was not feasible. His son was informed that the patient would probably live a comparatively short time, as it was reasonable to suppose that similar malignant tumors probably existed in some of the internal organs. The patient returned in about three months with closure of the lids, and insisted upon an operation even if he could be given sight for only a few weeks. After explaining again the probable malignant nature of the disease, and his acceptance of the situation, the tumors were removed. The largest of the number was removed from the upper and outer portion of the right orbit, through an incision over 1½ inches long through the lid just below the brow. All of the other tumors were removed through the conjunctiva. They varied in size, when fresh, from that of a small dried pea to the first joint of my thumb. He lived a year and a half, and died from progressive anemia, without having any return of the tumors. Microscopical examination of one of the tumors, made a few days after the operation, seemed to confirm the first opinion that the tumors were sarcomata. However, as the patient continued to live on without return of the growth, the pathologist changed his verdict, and the tumors were pronounced lymphomata.

Sub-conjunctival Dislocation of the Crystalline Lens in a farmer, who stated that five days before, while attending his cattle, a young cow had hooked him in the eye. His family physician had told him that the eye was destroyed, and sent him to the city for its removal. A large, ragged wound was seen in the sclera, below and a little to the nasal side of the cornea. The anterior chamber was occupied by a blood clot, and the iris could not be seen. The cornea was intact, but hazy; the wound was closed by a plug composed of blood clot and lymph. The globe was soft. The eye was easily enucleated. There was no other wound in the sclera, the horn having pierced the anterior wall of the globe only. The specimen was put in alcohol, where it remained undisturbed for three or four weeks. Upon bisecting it, the crystalline lens was found encysted outside of the sclera, and that, in making the section, it had been divided. It had evidently escaped from the scleral wound, slipped back between the ocular conjunctiva and the globe, and become encapsulated in a mass of inflammatory exudate.

MEETING OF THE BERLIN OPHTHALMOLOGICAL SOCIETY.

MEETING JANUARY 28, 1898.

Translated and abstracted from the Ophthalmologische Klinik, March 5, 1898.

BY H. V. WÜRDEMANN, M.D.
OF MILWAUKEE, WIS.

Kuthe. Practical Treatment of Keratomalacia in Infants. Has seen twenty-six cases of keratomalacia within four and a half years from 34,000 cases in Hirschberg's clinic. The treatment comprises that of the general condition; daily applications of collodion-cotton dressings and physiologic salt solution. The collodion bandage is recommended, as it remains perfectly in apposition with the eye and prevents too quick evaporation of the dressing. A considerable number of cases heal with entire closure of the pupil, which should be operated upon early in order to prevent increase of intra-ocular pressure and to make a visual opening which favors development of the retina. Canthotomy is to be done before the intra-ocular operation. He showed a case which had been under treatment.

Spiro. The Effect of Mydriatics and Myotics in Paralysis of the Pupil. Examination into the clinical aspect of the effects of mydriatics and myotics is accompanied with difficulties on account of the great differences of opinion in regard to the anatomic and physiologic basis. S. compares the latest reports upon the structure of the ciliary ganglion and alludes to the recent report of Schulz in the Berliner Ophthalmological Society concerning his experimental and physiological studies. At the request of Hirschberg, S. had systematically proved the work of Schulz regarding the effect of atropin and eserin in this clinic. He experimented upon twelve cases of total paralysis of the oculo-motor nerve in which paralysis of the pupil and accommodation was complete. The paralysis was mostly of recent origin. A few cases dated back as far as six years. In these atropin widened the enlarged pupil from 1 to 1½ mm. S. does not think that this means irritation of the sympathetic, but further paralysis of the not yet fully paralyzed nerve ends, as ascribed by Schulz. Eserin causes maximum contraction of the pupil after ten minutes. This completely contradicts the views formerly held regarding any effect upon the cerebrum. Whether eserin, as has been recently shown by Schulz, acts exactly opposite to atropin upon the nerve ends or affects the sphincter could not be explained by these clinical experiments. It is of interest that, in old cases of complete pupil paralysis, light caused some further contraction of the pupil. In these experiments 1 drop of a freshly prepared 1 per cent. solution of atropin, or 1 drop of a 2-3 per cent. solution of eserin salicylate was used. Further clinical experiments upon this subject are now going on in Hirschberg's clinic.

Hamburger showed a case *from Hirschberg's clinic of a 20-year-old man, who had previously been healthy, who lost vision after inflammation of the lungs.* The left eye, after a few weeks, became entirely blind, and the right lost considerable vision in a few months. Examination showed that there was atrophy of the optic nerve in the left eye, and in the right choked disk, with defect of the lateral visual field immediately under the fixation point. Diagnosis was made of tumor of the optic chiasm with entire destruction of the left nerve and interruption of some of the nerve bundles of the right, which proceed to the center of the right retina. The lateral nerve fibers of the right optic nerve remained intact.

Fehr spoke upon *Relaxation of the Eyelids, the so-called Blepharochalasis.*

Mendel showed a case from Hirschberg's clinic, in which *a splinter of copper had remained 5 years in the lens* without causing any irritation, and the eye had retained full vision.

Editors of the OPHTHALMIC RECORD.

Dear Sirs: In the report of the discussion on my paper, "*The Antiseptic preparation of the conjunctiva for cutting operations on the eye ball,*" read before the Western Ophthalmologic and Oto-laryngologic Association, I find my closing remarks in reply to my friend Dr. Knapp's discussion are incorrectly given. I stated as follows: "That I had probably seen as many of Dr. Knapp's cataract operations as any one—that they are simply perfection, and that his technique could not be in any way responsible for the case he mentioned."

THE

OPHTHALMIC RECORD

A MONTHLY REVIEW OF THE PROGRESS OF OPHTHALMOLOGY.

VOLUME VII. CHICAGO, JULY, 1898. NO. 7. NEW SERIES

ORIGINAL ARTICLES.

EXTRACTION BY ELECTRO-MAGNET OF A SMALL CHIP OF STEEL THROUGH THE ORIGINAL CORNEAL WOUND.

BY F. C. HOTZ, M.D.

CHICAGO.

Reported at Chicago Ophthalmic Society, May 10th.

On the 4th of March J. P., age 32, boiler-maker, called at my office for advice and treatment of his left eye. On the previous afternoon, while working with a steel die, he suddenly felt something hit his left eye, and the water run freely from it. He quit work at once and went home, where a physician dropped atropine into his eye.

I found slight pericorneal injection and in the cornea, a little above and to the temporal side of the center, a very small oblique linear wound; the pupil fully dilated; the upper temporal portion of the iris border notched; the upper portion of the lens opaque and swollen; its middle and lower portion hazy but still clear enough to allow an ophthalmoscopic examination which showed no disturbance of the vitreous nor any trace of a foreign body. Tn., no tenderness to pressure.

There could, of course, be no doubt that a foreign body, presumably a fragment of the edge of the steel die, had gone into the eye; the smallness of the corneal wound proved it to be a minute piece, and the rapid obscuration of the upper portion of the lens showed it made its way through the lens upwards and backwards. As no foreign body was detected in the lower part of the vitreous, nor any disturbance noticed indicating the passage of a foreign body through the vitreous, the conclusion seemed warranted the fragment was lodged in the vicinity of the upper edge of the lens (either in the lens or above it in the ciliary portion of the choroid). Since the lens was already broken up so that its total obscuration was only a question of time, I thought the best way of extracting the steel fragment would be by introducing the magnet point through the original corneal wound.

I sent the patient to the Presbyterian Hospital, and in the afternoon performed the operation under cocaine anæsthesia as follows:

With a cataract knife I enlarged the corneal wound so as to obtain a small curvilinear incision, which would permit the easy introduction of the magnet point. The incision made, some soft lens matter escaped at once. A slightly curved point attached to the magnet was then inserted, and slowly passed through the cataractous lens upwards and backwards until I judged its end was close to the upper wall of the globe. After few seconds it was slowly withdrawn; it did not bring out the steel, but I now noticed in the gray lens substance a minute black body which had not been there before. The magnet was again inserted, the black body attached itself and clung to it, and was easily and successfully brought out through the corneal wound.

It was a very small triangular chip measuring 1½ mill. at its base, and covered by a thin layer of bloody vitreous, from which I inferred it had been embedded in the choroid and had been torn away by the magnetic attraction.

Under atropine treatment the eye passed a very comfortable week, although the remaining lens substance became rapidly opaque and swollen. During the second week a steady increase of tension associated by increased injection of the eye and some supraorbital pain necessitated the removal of the bulk of the swollen lens through a linear incision of the cornea. After this operation the healing went on very smoothly, but vision of course is still very imperfect (counting fingers) on account of the remaining capsular cataract.

STEEL IN THE VITREOUS, LOCATED BY MEANS OF THE X-RAY AND REMOVED WITH A MAGNET, WITH DESCRIPTION OF AN ARRANGEMENT FOR DETERMINING WHEN THE MAGNET HAS FOUND THE STEEL.

BY ELMER G. STARR, M.D.

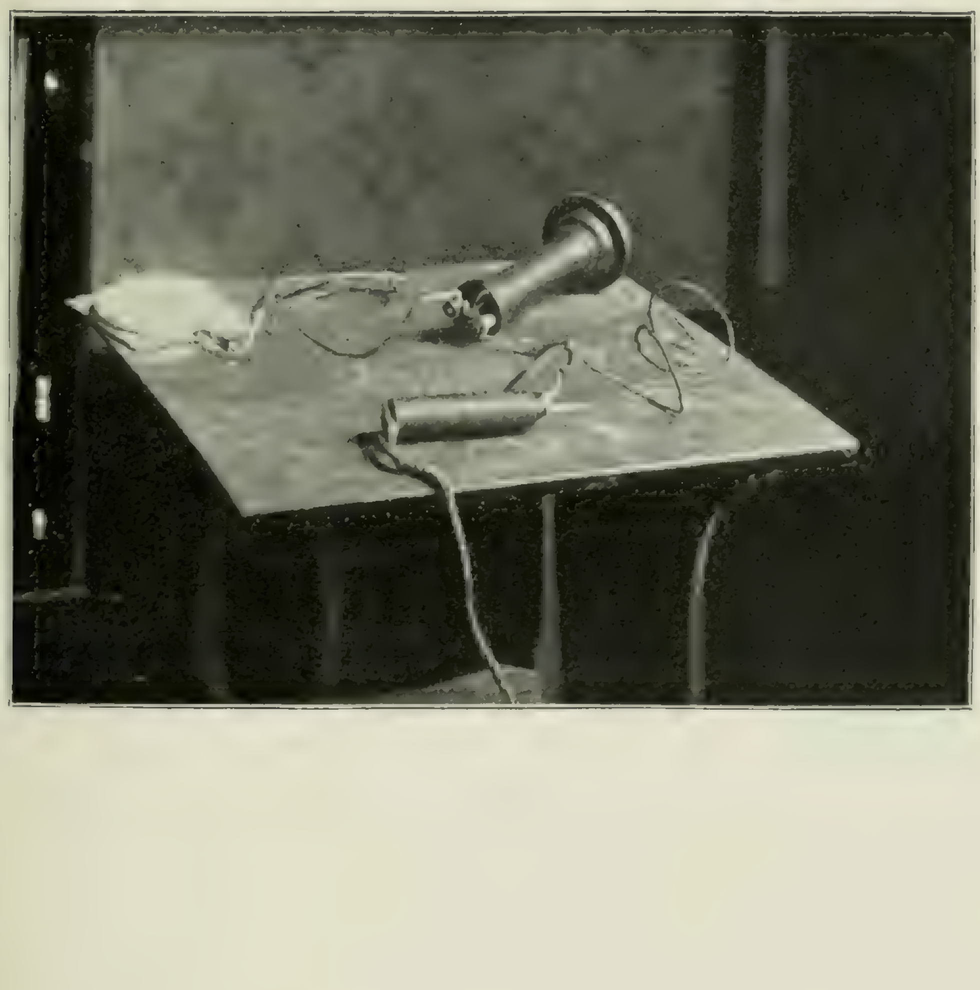
Clinical Instructor of Diseases of the Eye, Medical Department, University of Buffalo.

BUFFALO, N. Y.

Illustrated.

A workman while using a steel chisel was hit in the eye by a scale flying from the head of the chisel as it was struck with a heavy hammer.

The patient was first seen by me forty-eight hours after the injury. At this time the vitreous was so filled with blood that no reflex could be seen. A cut appeared in the sclerotic above and about six millimeters from the corneal



margin. There was a corresponding cut about five millimeters long through the upper lid. A small opening through the sclerotic was found which admitted a fine probe into the vitreous. There was discoloration of the iris, and marked ciliary injection but only slight pain.

The eye was exposed to the X-ray and the piece of steel could be seen with the fluoroscope freely moving about as the eyeball rotated.

After an anæsthetic was administered a small opening was made through the sclerotic at the side (its lowest point as the patient lay on his side), and the point of a powerful electro magnet was presented to the lips of the cut.

Connected with the magnet was a telephone as shown in figure, one terminal of the telephone being in connection with the point of the magnet and the other being connected with a zinc plate covered with a moist sponge which was held in contact with the patient's body. As soon as the attraction of the magnet drew the piece of steel into contact with its point a distinct sound was heard in the telephone which was held to the ear, thus showing that the steel had been found and making it unnecessary to explore further with the magnet point.

In this instance the moment the magnet point was presented to the wound the piece of iron came to it. In another case where a bit of iron had become entangled within the eyeball in its coats, this device made it possible to know just when and where the body was found so that it was possible to follow along the magnet tip with forceps and sieze the iron. The forceps made for this purpose are of hard brass, nickeled, as steel forceps would cling to the magnet and be unmanageable.

A PIECE OF STEEL IN THE VITREOUS LOCATED BY MEANS OF THE RŒNTGEN RAYS ACCORDING TO SWEET'S METHOD; REMOVAL OF THE FOREIGN BODY WITH THE ELECTRO-MAGNET.*

BY G. E. DE SCHWEINITZ, M.D.,
OF PHILADELPHIA.

The following case is interesting as another example of the value of the Rœntgen rays in detecting metallic foreign bodies within the eyeball, and of the accuracy with which they can be localized by means of the method already detailed to this Section by Dr. William Sweet.

Arthur Grove, of Columbia, Pa., aged 18 years, while striking with a hammer on a steel drill, received an injury on the morning of March 25th, a piece of metal from the hammer or the drill (he could not say which) striking him in the left eye. Immediately after the accident he consulted Dr. Alex. R. Craig, who observed a cut in the cornea and the lens, but who, even at that early date, was unable to see the fundus owing to the rapid opacity which had taken place in the media.

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*Read before the Ophthalmic Section of the College of Physicians of Philadelphia, April 19, 1898.

I saw the patient at four o'clock, by the courtesy of Dr. Craig, on the same day on which the accident had occurred, and found a small cut in the center of the cornea, about 4mm. in length, from which was protruding a thin string of vitreous. A similar cut could be observed in the capsule of the lens and the lens itself was almost entirely opaque. In fact, only a faint glimpse of the red reflex of the fundus could be obtained through one small quadrant upward and inward. The anterior chamber had refilled and the iris was slightly discolored. There was no pain, but considerable bulbar injection. Vision equaled seeing the outstretched fingers at one foot.

The boy was taken to the Jefferson Medical College Hospital, where Dr. Sweet very kindly made skiagraphs which at once demonstrated the presence of the foreign body apparently far back in the eye, although the proper method of localization could not be applied until the next day, when, aided by other negatives, the following result was obtained and is thus recorded by Dr. Sweet: The piece of metal, which is small and about 3mm. long and 1mm. wide, is situated 1mm. above the horizontal plane of the globe, 1.5 mm. to the nasal side and 23 mm. back of the center of the cornea. This would bring it in the retina in the neighborhood of the macula.

At this time, or about fifty hours after the accident, the eye presented the following appearances: Marked bulbar injection, some discoloration of the iris. a thin shred of opaque vitreous at the edge of the wound in the cornea, the lens entirely opaque and of a suspicious yellowish hue, and a faint yellowish line at the bottom of the anterior chamber which appeared like hypopyon but may have been only a reflection from the edge of the lens.

Consent having been obtained for an operation, with the assistance of Drs. Veasey and Sweet, I laid back a triangular flap of the conjunctiva, between the inferior border of the external rectus and the edge of the inferior rectus, thoroughly exposing the sclera. Then, just a little below the lower margin of the external rectus, an incision was made through the sclera downward and outward about a centimeter in length. The lips of the wound being retracted with two small hooks, the broad flat extension point of a Hirschberg magnet was introduced for 15mm., so as to bring it as nearly as could be calculated over the position of the macula. The current was turned on, and on withdrawing the extension point the piece of steel, of a triangular shape 2mm. at its base, ½mm. at its apex and 3mm. in length and weighing 9 milligrams, which is here exhibited, was found adherent. The scleral wound was closed with a single catgut suture, and the conjunctiva sewed over this with interrupted silk sutures. A sixth of a grain of calomel every three hours was ordered, and continuous cold compresses.

The patient remained in the hospital for one week, keeping up the cold compresses at first continuously, and afterwards for ten or fifteen minutes, four or five times a day. There was little or no reaction, in fact the lids were never swollen. The cornea regained its transparency, the lens was entirely opaque and of a curious yellowish color, the iris somewhat discolored, and there was considerable coarse bulbar injection. He now returned home and was placed under the care of Dr. Alex. R. Craig, who reported that he continued to do well until the night of April 14, 01, in other words, eighteen days after the operation, when brow pain and general restlessness developed. The eye became much injected, the tension raised, the anterior chamber shallowed and the pupil irregular. Under the influence of free leeching and the internal administration of iodide of potassium Dr. Craig dissipated the pain and reduced the inflammation and tension, the symptoms evidently having been caused by swelling of the lens and the development of secondary glaucoma.

Four days later I again saw the patient and found the following conditions: Coarse bulbar injection, slight steaminess of the cornea, markedly discolored iris, a chalky white and swollen lens, tension + 1. The light projection was good in all portions of the peripheral field, but central fixation was imperfect. Treatment was continued, but the patient advised that enucleation, or evisceration, might be necessary. In spite of the unfavorable appearances of the eye, from this date improvement began, and under Dr. Alex. Craig's judicious care continued uninterruptedly.

Addendum. I have had an opportunity of examining this patient very recently, namely, on the 17th of June, and found the right eye normal in all respects, the left eye white and quiet with good light perception in all portions of the field; the lens opaque and chalky appearance, and the iris is adherent to its capsule. There is no doubt that if it were necessary an extraction of this lens could be performed.

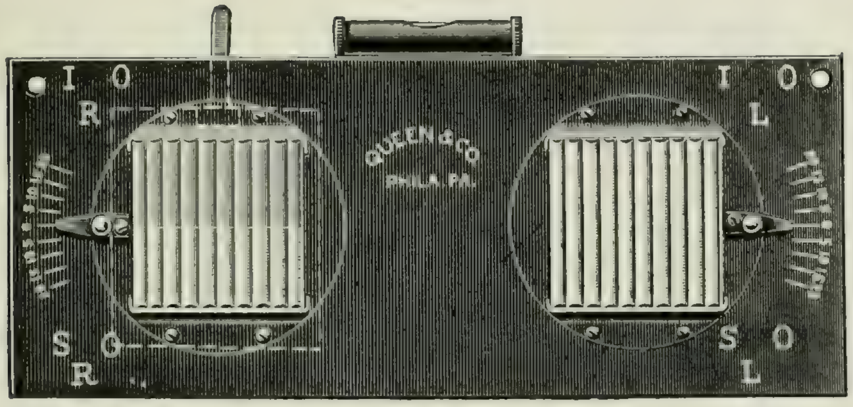
AN ARRANGEMENT FOR TESTING THE OBLIQUES AT DISTANCE.

WM. E. BAXTER, M.D.
BOSTON.

Illustrated.

In making the test of the obliques at distance where a combination of two separate appliances are used before one eye at the same time, some convenient arrangement is required to enable one to make this test expeditiously, this is especially so if the test is to be made use of in the everyday work of the busy oculist. The trial frame does not meet this requirement, as very frequently correcting lenses are already in the trial frames when this test is to be made, and there will be no room for the additional appliances; neither is a *second* trial frame on the face convenient. The arrangement about to be described enables one to place before the eyes of the patient the combinations of rods and prisms necessary for this test in an expeditious manner. This instrument consists of a metal plate five inches long by two and one-half inches wide, having two sets of Maddox rods, placed before two circular openings, the rods arranged so that one shall be before each eye, these rods are set with their axes vertical, and so forming bands of light extending in a horizontal direction when a distant point of light is looked at through them. An indicator is placed on the outer edge of these sets of rods, and when the bands of light are horizontal, the indicators point to zero; a scale marked off into divisions of 2½° is placed both above and below the zero marks; and on the plate near the index, on the right side, above the 0, Right Inf. oblique, and below the 0, Right Sup. oblique is marked, and near the left index above Left Inf. oblique, below Left Sup. oblique, the indicator showing at a glance which muscle is at fault. There is a small handle near each indicator by which the rods are revolved. Behind the rods, running in a groove, is a slide containing a double prism with the axis horizontal, this slide may be pushed before either eye, or left between the rods, and out of the line of vision if desired. A level may be used to render the lines of light approximately horizontal, though its use is not necessary. The instrument may be used on a phorometer stand, or, as the writer has found it convenient, suspended from the ceiling over the chair used for refraction work, by means of cords and weights; by this means the instrument may be brought before the patient's eyes and steadied by the hand, and when not in use may be pushed up out of the way, where it will remain balanced by the weights. In use this instrument is placed before the patient's eyes—any correcting lenses being in position—the double prism placed before one eye and the instrument moved slightly until the three bands of light are seen, any dipping of the middle line is at once noted, and corrected by revolving the rods before the eye that is not looking through the double prism, when the quality and degree of the defect can be at once read from the face of the instrument. Under the old method of testing it was sometimes difficult to make the patient understand just what was to be observed, but it is very simple to give the rods before the eye under test a decided tip, when it will at once be understood what is required, and when the line is brought up parallel the fact is quickly noted. The instrument can be obtained at a moderate price from Queen & Co., Philadelphia.

553 Boylston St.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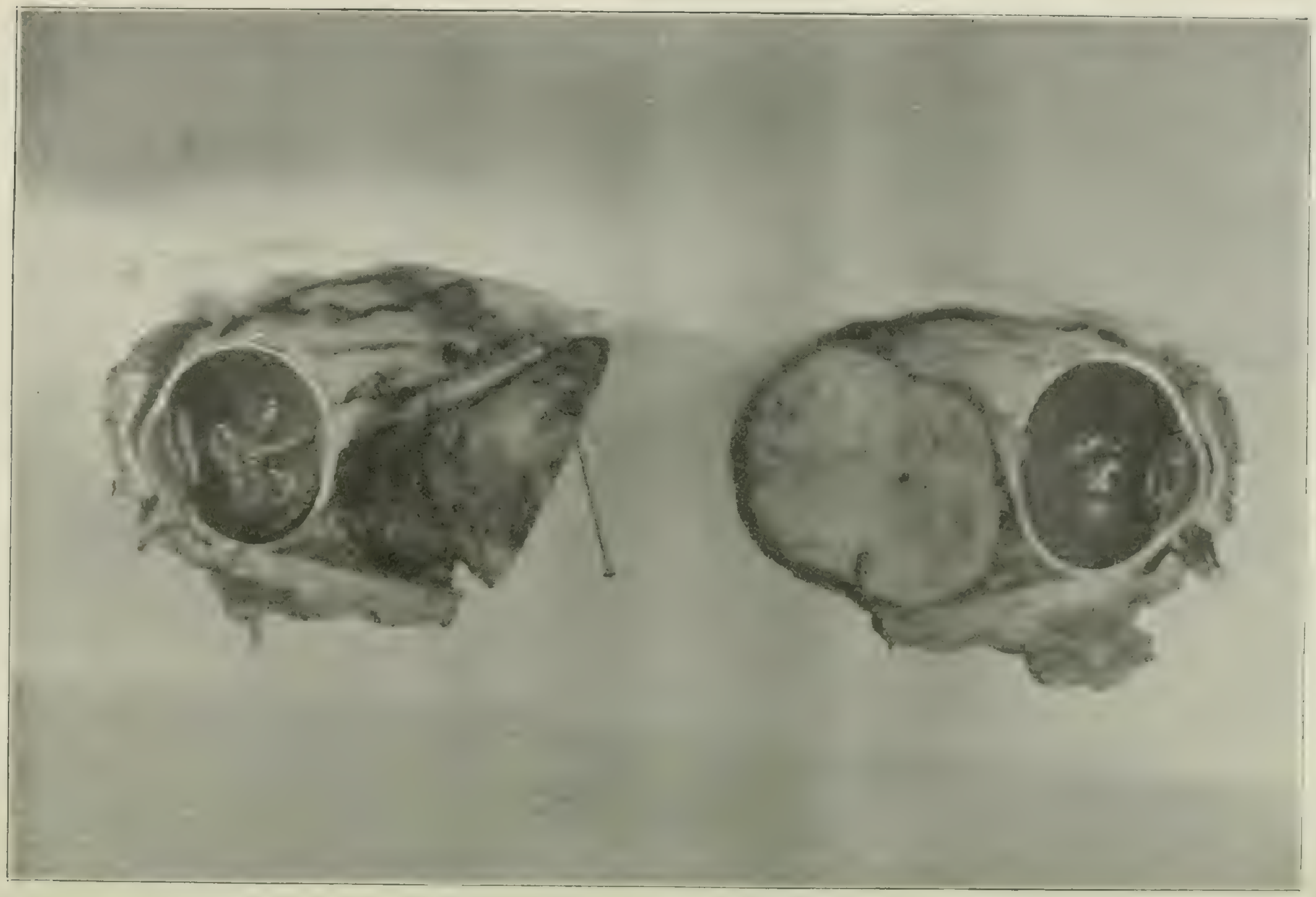
SARCOMA OF THE ORBIT.

BY ALEX. W. STIRLING, M.D., M.B., C.M (Edin.), D.P.H. (Lond.)
ATLANTA, GA.

(Illustrated.)

The diseases most likely to be confounded with orbital sarcoma are chronic abscess or periostitis, distension of the frontal sinus, meningocele, protrusion of only one eye in exophthalmic goitre, other tumors originating in the eye or orbit, or outside them, gumma, dermoid or hydatid cysts, exostosis, carcinoma, foreign bodies, erectile growths, and varix appearing some time after accident, especially fracture of the base of the skull. Neuroma, lipoma, and fibroma are extremely rare. It is not intended that this short paper should deal with any of these. The differential diagnosis is sometimes easy, but in other cases it can be made only by operation or by microscopical examination. My remarks today will deal with sarcoma, the most common of orbital tumors, and chiefly with the view of determining their prognosis. I shall have to refer also to sarcoma of the uveal tract. As a typical illustration of *primary* orbital sarcoma I cannot perhaps do better than recite the symptoms and treatment of the case, the contents of whose orbit I now pass round for your inspection. Miss M. A., age 13, a twin, seen first in May, 1897. Has a good family history. No cancers in the family except in the cases of a great aunt and a second cousin. Her own health has always been good, no history or appearance of syphilis. She has never received a blow near the eye. About three years earlier the left eye had begun to protrude, and this had gradually become more marked, though it gave no trouble till quite recently, when pains began to occur in, and at the back of, the eye. Proptosis was more marked when the patient was warm, and a few days before I first saw her a little blood had oozed from the outer canthus. On inquiry I was told that during the previous two years she had appeared to become mentally rather dull. Her condition was that of a tall, healthy, but rather stupid-looking girl, in whom the right eye was deeply set, but the left, when looked at from above, the upper lid having been retracted, was visible nearly to the equator. Movements upwards, downwards, and outwards were rather limited, but not markedly so. The conjunctiva was congested, but not actually inflamed, opposite the palpebral fissure; the cornea quite clear; the pupil, which acted slowly in a dim light, was smaller than that of the right eye, but larger than it with good illumination. There was very little pain from pressure on the globe, which did not then recede. When the finger was pushed into the orbit to the upper and outer aspect of the globe some pain was complained of, and here also an elastic, non-pulsating swelling could be made out. There was no enlargement of the premaxillary or other glands. The ocular tension was normal, R.V.=6/6. H.M. .75, D.6/6. The fundus was normal, with a deep physiological cup. L.V.=p. l. Media clear. O.D. white, and seen with + 14 D., periphery of retina seen with + 2D., and between these with + 6D. or + 8D. The veins were rather large, some of them slightly tortuous; one small tortuous vessel on the disc had given rise to a minute hemorrhage. The vessels were seen to curve to a lower level on leaving the disc. Three days after the examination, ether having been administered, a preliminary exploratory incision was made through the upper lid just beneath the eyebrow, and through it a firm growth was made out with the finger. An incision was then carried through the *skin* of both lids 3 m.m. from the lashes, the skin was dissected back all round so that the finger and instruments could enter the orbit behind without opening into the conjunctival sac. The lids, exclusive of the reflected skin, and including the lashes, the globe, tumor, and all other contents of the orbit were then removed *en masse*. Hemorrhage was slight, and the operation occupied fifteen minutes. At the beginning of the fourth day, when oozing had practically ceased, the walls of the cavity were covered by strips of lint on which had been spread a paste of chloride of zinc of a strength of about three drams to the ounce, including about twenty grains of opium. This gave rise to no pain, and was left for three days, when it began to slough away. The temperature never rose above normal, and the patient made an uninterrupted recovery. The lids fell in and became adherent to the orbital walls within a week, while between two and three months later these were entirely skinned over, the result being more cleanly and comfortable than when the lashes are allowed to remain. A year has now elapsed since the operation, and there are no symptoms of recurrence in any part of the body.

In 1891, Messrs. Lawford and Collins published (Royal London Ophthalmic, Moorfields, Hospital Reports, Vol. XIII., pt. II., Dec., 1891,) the results of their investigations concerning 103 cases of undoubted sarcoma of the uveal tract which had been operated on in, and recorded



Showing method of operation by making an incision through the *skin* of both lids, 3 mm. from the lashes, dissecting back the skin as far as necessary and then entering the orbit without opening the conjunctival sac.

in the books of, the Moorfields Hospital. In some of these the orbit was *secondarily* involved.

In 1893 I published, with full particulars of each case (Royal London Ophthalmic Hospital, Moorfields, Reports Vol. XIII, pt. IV, Dec., 1893), the results of my own inquiry into all the cases of undoubted *primary* orbital sarcoma upon the books of the same hospital from 1858 till that date, mainly with the object of discovering the true prognosis in that disease which had not yet been ascertained. I was somewhat surprised to find that these numbered only twenty-eight, excluding a case of sarcoma of the lacrymal gland about to be reported by another surgeon. I had intended to incorporate with them cases from the Royal Westminster Ophthalmic Hospital, but time failed and I had to content myself with only one case from that hospital which I had then frequently an opportunity of seeing. I had in several cases to appeal to the National Registration office at Somerset House, London, in order to discover whether or not the patient still lived, or what had been the cause of death. The results of these investigations show that sarcoma attacks both the uveal tract and the orbit in *males and females*, in about equal numbers; the average *age* in uveal sarcoma was forty-eight and one-half years, varying from fifteen to eighty-four, and in primary orbital cases the growth first appeared on the average at twenty-eight and one-sixth years, varying from three weeks to seventy-five years; there seems to be little tendency for the one *side* to be affected more frequently than the other; 14 of the 103 uveal cases had a history of "tumors" in near *relatives*, and in 38 others no notes had been made on this subject, while of the 29 primary cases 2 gave a history of the death of a parent from cancer, and in 15 cases no statement on the point was forthcoming; *previous injury* to the eye had positively been received in nearly 7 per cent. of the uveal cases and in 17.5 per cent. of the orbital. *Recurrences* took place locally, among the 79 uveal cases which could be traced, in 7 cases, and at times varying from a few weeks to three years after the operation. In three cases the recurrent growths were removed once, in one on three separate occasions. In three, and probably in four, of the seven, metastatic growths occurred. In every case in which recurrence took place the patient died of sarcoma, except in one who was alive twelve months after the second operation. In the primary orbital cases recurrence took place in 58.6 per cent., on the average twice for each of these cases, one undergoing as many as five separate operations. The average time elapsing between operation and recurrence was twenty months, but if one case be left out of account in which the primary growth was not microscopically examined and was removed thirty-eight and one-half years before the recurrence, which was a true sarcoma, the average age is reduced to eight months, while cases occurred at three and one-half, three, and two years after the first operation. We see here a marked difference between growths primarily affecting the uveal tract and those beginning in the orbit, for while in the former only 8.86 per cent recurred in the region of the orbit and death in 32.9 per cent was almost certainly due to metastasis, most frequently in the liver, in the latter when recurrence took place at all the orbit was always affected even when other organs were attacked. Lawford and Collins found no connection between the shape and arrangement of the *tumor cells* and the tendency to recurrence. All their growths were more or less pigmented. In the primary orbital tumors which recurred round cells predominated. No case is noted as having been pigmented. The *results of operation* in the primary orbital cases were that of the ten cases in which the growth alone was removed without clearing out the contents of the orbit recurrence took place in nine, and the tenth had been under observation for only eighteen months after the removal of the growth. Where all the contents of the orbit were removed, sixteen cases, seven had had no recurrence after an average of four and one-sixth years, and in only three of these latter had a less interval than two years elapsed. This seems to point to a distinct advantage in making the removal as complete as possible. As for the *prognosis* Lawford and Collins took a three years' immunity as a sign of probable but by no means absolute safety, and on that basis 25.31 per cent. of their uveal cases recovered. In the primary orbital cases youth seemed to predispose to a fatal termination, for I found that of eight cases under ten years of age four had already died, three were then under observation, having been recently operated upon for recurrences, and that one was quite well after operation seven years before. Of those older than ten 30 per cent. were dead and 70 per cent. were alive at an average interval since operation of over three years. Three years after operation at all ages some 17 per cent. were alive, but that is too short an interval to be a guarantee of absolute safety. It is therefore probably less dangerous to have a uveal sarcoma than a sarcoma of the orbit, as might be expected from the differences in environment.

THE

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EDITORIALS.

THE DENVER MEETING OF THE AMERICAN MEDICAL ASSOCIATION—SECTION ON OPHTHALMOLOGY.

The 1898 meeting of the American Medical Association at Denver, Colo., June 7th-11th, was largely attended and, as usual, very profitable to the members of the association. About eighteen hundred physicians and accompanying ladies were registered and entertained in a manner well corresponding to the large-hearted reputation hitherto borne by the Great West. Seventy-five were registered at the Section on Ophthalmology.

The scientific work of most of the sections was up to the average, but in several the programs were overcrowded, a number of inconsequential papers being allowed to creep in. A more than usual number of absentees from the list of members whose names were on the program for papers was noted. Men who are unable to meet their engagements, should make it a point to have their names removed from the Secretary's list of promised papers before such be included in the final program. One of the small annoyances to the audience is the non-appearance of an author, whose name and paper have been published far and wide, and who is perhaps one of the principal attractions of the meeting.

The cloture rule of the general executive committee which limits the reading of papers to ten minutes is a hindrance to the proper presentation of some original work, for which more time should be given. This was particularly evident in the Section on Ophthalmology in the case of C. M. Holmes' paper on "Extirpation of the Lachrymal Sac and Gland." But little beyond the conclusions of the paper could be given by the essayist. A large amount of original work was lost to the audience, and the description of his fifty-odd head preparations had to go by default. I am sure that all of us would have been willing to listen to Holmes for an hour upon this most interesting subject. In future meetings a plan should be evolved for one or two addresses by invitation upon special topics, and sufficient time be allowed for their elucidation.

G. C. Savage's new theory regarding the binocular field of fixation is a movement forward in the field of ocular muscle imbalance, and these, with the exception of Randolph's paper upon "Clinical and Bacteriological Experiments with Holocain," were the only novel subjects presented. The discussions of Thompson's paper on "Glioma," Reynolds on "Phlyctenular Keratitis," and those on Lacrimal Diseases proved to be experience meetings, which were profitable on account of interchange of views.

It is to be hoped that our next meeting will be more productive of original research. The fact that the time of the scientific sections is cut short during the morning sessions, to allow of attendance upon the general meetings with their political fuss and fol-de-rol, has raised considerable criticism, and it is desirable that more of the general session work be placed in the hands of the executive commitee, and thus valuable time saved to the scientific sections. H. V. W.

Tuberculin in Tuberculosis of the Eyes.—Six years ago Zimmermann enucleated the left eye of a patient for ocular tuberculosis. A year ago the other eye became affected in the same way, and while the tuberculous patches were cauterized tuberculin was administered, commencing with 1-500 milligram and increasing in a month to 0.02 to 0.03 every second or third day. The patient is now practically cured, and a series of similar experiments on animals confirm the favorable results of tuberculin as a therapeutic agent in ocular tuberculosis in man and beast.

Ichthyol in Affections of the Eye.—M. Eberson recommends ichthyol in the highest terms, especially for children, in treating trachoma, as it shortens materially the course of the disease and ensures complete recovery. It also heals rapidly all cases of catarrh of the conjunctiva, with or without corneal complications. It is also a powerful agent in clearing up cicatricial formations in the cornea. He uses a 50 per cent. aqueous solution, to which a little glycerin is added, applied and left a minute or two. The *Klin-Therrap. Woch* of May 1 contains his report of numerous observations during the last two years.—*Journal of the American Medical Association.*

REPORTS OF SOCIETIES.

CHICAGO OPHTHALMOLOGICAL AND OTOLOGICAL SOCIETY.

A regular meeting was held April 12, 1898, with the president, Dr. W. F. Coleman, in the chair.

Dr. C. D. Wescott presented a case of *Congenital Cataract*, apparently not progressive, in a man twenty-seven years old. Among his brothers and sisters and their children there are twenty cases of congenital cataract, two of which have been operated upon, and one has been given very much better vision by operative interference. He is unable to tell me whether a simple iridectomy was done, or whether the cataract was removed or dissolved. Dr. Wescott thinks an operation of some sort is feasible in this case. Vision in one eye is $\frac{20}{200}$, and in the other $\frac{20}{100}$, and not materially improved under atropin. The opaque portion of the lens is so large that when the pupil is fully dilated there is only a narrow ring of transparent lens visible. He does not believe iridectomy offers enough encouragement to attempt it, but one eye is practically of no use to him. He reads with the other eye with the aid of a strong glass.

Dr. Albert B. Hale has had one case similar to the one reported by Dr. Wescott. It was a young man, twenty-three years of age, who had been exhibited to the society on a previous occasion. His vision was materially improved by atropin. Dr. Hale did not have very much confidence in an iridectomy, and is glad he did not do it. However, he did five needling operations on one eye, as the capsule was tough, but it finally yielded, the vision in that eye amounting to about $\frac{20}{40}$. There was a great deal of difference between the two eyes. When reading he uses the unoperated eye. If he blinds either eye, he gets benefit from it. His profession is that of a stage acrobat and variety-show entertainer, and he objects to wearing glasses. He cannot see quickly enough on account of the asymmetry.

Dr. Robert Tilley: The point mentioned by Dr. Wescott that there was no improvement whatever after the use of atropin is considerably against the hope of vision being greatly restored, but at the same time vision is so bad in one eye that it seems as though it will be worth while to make the effort.

Dr. W. F. Coleman would operate on the left eye, the worse of the two. The asymmetry is an objection, but not so great as the text-books make it. He has seen several patients with one aphakic eye and with a lens in the other get good binocular vision with correction. There is so little clear space beyond the lens in this case when the pupil is dilated that he would not expect to improve vision by an iridectomy. Dr. Reynolds a day or two ago, before the *Western Ophthalmologic and Oto-laryngologic Association*, spoke freely of extracting the lens in congenital cataract. Personally, Dr. Coleman has had an unfortunate experience in extracting two lenses in congenital cataract, so that he is afraid to extract *en masse* the lens in such cases. He would prefer to needle it up to the age of forty. He would not hesitate to resort to needling in these cases, but would fear the result of extracting the lens in a case of congenital cataract, which appears to be for some reason or other particularly irritating if the eyeball is opened. He would repeat the needling, if necessary, half a dozen times. He would favor treating the worse eye, and, as Dr. Hale has said, in all probability with success on the poorer eye the patient would want an operation on the other.

Dr. C. P. Pinckard showed a patient with an interesting condition of the lids, a condition he has not seen anything like before. It started some six weeks ago in the form of a stye. The stye was opened, and for a day or two apparently got better. Shortly after, however, the lid began to swell considerably and an ulcerative process commenced in the neighborhood of the stye, involving the conjunctival border of the lid perhaps half an inch toward the outer canthus. One of the meibomian glands upon the center of the lid began to suppurate. There was no previous chalazion whatever, and from the gland extending clear through the duct to the border of the lid the same process started up. The peculiarity connected with the case is the character of the ulcer. Along the border of the lid it destroyed the tissue very rapidly, so that in wiping it off there came away not only a good deal of pus but shreds of the lid tissue itself. The ulceration of the meibomian gland broke through into the conjunctiva and a considerable quantity of the tarsus has been destroyed as well as the superficial parts of the conjunctiva extending down to the border of the lid. First treatment was mild, followed, however, by strong escharotics, such as the use of nitrate of silver and powerful solutions of corrosive sublimate, but all the time the pathologic process kept advancing. When the case first came into his care, ichthyol was started, and it seemed to have a slight beneficial effect on the diseased condition. After two or three days the improvement not being marked, Dr. Pinckard started chinosol solution in the strength of 1 to 1500, and from that time it has continued to improve. The principal point is as to the nature of the ulceration. There is absolutely no history of any general infection. Dr. Evans, in the Columbus Medical Laboratory, examined some of the pus and tissue from the edge of the ulcer for tubercle bacilli with negative results. An inoculation was made in gelatin, and after two days there was no growth. Then an inoculation was made in agar, and then in agar and glycerin, and kept in the incubator for twenty-four hours with no result. So we have nothing whatever to go by in this destructive ulceration of the lid. If it be tuberculosis of the lid, it certainly assumes a very unusual form. The. hair follicles are not involved. The ulcer is now in the healing stage, but shows the large amount of necrosis which has taken place.

Dr. Robert Tilley: The case reported by Dr. Pinckard is interesting as well as curious. Chinosol, of which he speaks, is being lauded as a valuable antiseptic, and yet at the same time there does not seem to be any vestige of any bacteria to be found on the minutest observation. Dr. Tilley has used chinosol with apparent satisfaction under certain circumstances.

Dr. C. P. Pinckard: This must be from our present knowledge a septic process, in spite of the fact that no culture could be made, and that powerful antiseptics like silver and corrosive had no beneficial effect. They made it worse, and during their use the disease spread rapidly, the tissue broke down, and there were shreds of tissue at the bottom of the ulcer.

Dr. H. W. Woodruff, of Joliet, Ill., showed a case of *Embolism of one of the Branches of the Central Artery of the Retina* in the left eye in a young lady twenty years of age. Diminution of vision came on suddenly. She has a refractive error in both eyes. Dr. Woodruff saw her five days afterwards, and found on ophthalmoscopic examination what is undoubtedly an embolism of one of the branches of the central artery of the retina. The light edematous area is to be seen toward the temporal side of the disc. The occluded artery can be seen only at the edge of the disc. The veins are plainly visible over this light area. Her direct vision is 20/120. There is a large scotomata in the field of vision corresponding to the occluded area. There is no sign of any kidney or heart disease. Her urine has been examined, and shows no albumin and but a trace of sugar.

Dr. Albert B. Hale read a paper entitled *Statistical Review of Five Hundred Consecutive Eye Cases*, presented at Eye Clinic, United Hebrew Charities, West Side Dispensary.

Dr. Elmer A. Lawbaugh reported a case of *Bilateral Temporal Hemianopsia in Acromegaly* in a woman forty-three years of age, who has had four children three of whom are living; family history negative. First noticed disease eleven years ago, when menstruation ceased and a constant constipation commenced, which is relieved only by a very active cathartic. Headache constant, always occipital, sometimes referred also to the top of the head near the anterior fontanelle. Memory very poor; somnolency present. Tongue and tonsils greatly enlarged, and a tickling sensation present. Typical condition of the hands and feet, enlargement of the head, pronounced prognathism, numbness in extremities, tactile sense impaired, urine normal, great thirst, good appetite; thyroid gland not enlarged, and no thoracic thyroid to be found. Kyphosis and joint pains present. Height, 5 feet; previous weight, 130 to 135 pounds; present weight, 186 pounds. Wore No. 4 shoe formerly, now a No. 7, men's arctic. Chest measure, 41 inches. Eye symptoms: Lids thick and edematous; conjunctivæ and corneæ normal; lachrymal apparatus normal; pupils normal in size, but sluggish in action. Partial atrophy of both discs, veins congested and arteries small and pale. Retinæ normal, as also action of muscles, though very slow to demands of will. Fields of vision, as shown by perimeter, in which colored lights were used, show bilateral temporal hemianopsia in white, blue, red and green fields. Right vision =10/200; left vision =10/20.

Discussion.—In answer to Dr. Tilley, Dr. Lawbaugh said that eye symptoms were present in from forty-five to fifty per cent. of the cases. Since 1890 there has been reported twenty-one cases of bilateral temporal hemianopsia, and there is one case of homonymous hemianopsia reported by Sir William Broadbent in 1897. There have been a number of autopsies reported. Dr. O. T. Osborne, who reported a case at the last meeting of the *Association of American Physicians and Surgeons*, has probably made the most thorough autopsy of any man. He is inclined to the opinion that the disease is due to a lack of function in the pituitary body; that there is an association between the pituitary body and the thyroid body, and that when there is a lack of function of the pituitary body it is thrown on the thyroid, and that when there is no action of the thyroid we have the disease acromegaly. In this case the wrist measures 8½ inches around, and over the ankle she measures 15 inches. Kyphosis is almost always present. The sternum and intercostal cartilages are enlarged. A number of theories have been advanced, but no one is able to arrive at a satisfactory solution.

Dr. Lyman Ware: It seems that Dr. Lawbaugh has given this case a great deal of study, and that the only thing lacking about it is an autopsy. He saw one case a number of years since with beginning atrophy, the result in all probability of bone constricture or pressure. Bones of the skull were very thickened and enlarged, so that vision in one eye was practically gone, and very nearly so in the other. He has no doubt in this case the trouble arose from the enlargement of the bones.

Dr. C. D. Wescott examined one of these patients as to the eye symptoms some four or five years ago, the case having been presented to the *Chicago Medical Society.* There was some narrowing of the fields with partial atrophy of both nerves, but vision with correction was about 20/100 in both eyes. He did not take the fields for colors. The patient was sent to him because of a constant headache. He found that simple spheres with possibly low cylinders improved vision a little and gave them a trial, but the patient reported, some weeks later, that they were of no benefit to him whatever. It was evident that the pain had no relation whatever to the error of refraction, and he does not know what caused the atrophy of the nerve.

Dr. C. P. Pinckard has seen three cases—the one reported by Dr. Wescott, which was shown to the *Chicago Medical Society* by Dr. Moyer, and two others since—and none of them had any subjective symptoms of eye trouble.

Dr. E. A. Lawbaugh: This is the fourth case he has seen, one in New York and one in Baltimore. The one in Baltimore had temporal hemianopsia in the right eye, with total atrophy of the left, but the other two presented no eye symptoms at all.

Dr. W. F. Coleman has seen two cases similar to the one reported by Dr. Lawbaugh. One was that of a young woman, twenty-two years of age, a stenographer by occupation. She noticed that she could not see to the right side. She had a bilateral temporal hemianopsia. She did not complain of eye symptoms, and was indifferent about the whole thing, so that her case could not be followed, and she was not seen more than once subsequently. She went on with her work, the eyes giving her no inconvenience, apparently. The second case was seen within the last year. It was a man, seventy-five years of age, who, in stepping off a street car, fell, striking his head, and had a severe shaking up. He was not rendered unconscious, and the accident gave him no inconvenience for some days after. Then he had some loss of motion and of sensation generally. He had alexia. He sat down and wrote a letter, but he could not read it. He could see letters and trace them with his finger. Vision was 20/40, yet he could not name the letters of Sn 200 at the distance of a foot. He had right temporal hemianopsia, with contracted field for all colors. The left eye had imperfect vision, which he said had existed since his earliest recollection. He learned with training to read letters better. He commenced with the alphabet, and began to relearn the letters, but still would miss quite a number of letters that were pointed out to him.

Dr. E. A. Lawbaugh: Benson, in the *Dublin Medical Journal*, reports a case of bilateral temporal hemianopsia in a case of acromegaly of a man who was considerable of a drinker and smoker, and after dropping these habits the normal field of vision was regained. He attributed the symptoms to the pressure on the chiasm, the tumor being increased by these dissipations, and upon their cessation the normal size of the pituitary body was restored and the pressure was relieved on the chiasm. The patient afterwards resumed his old habits, with resultant atrophy in one eye and of temporal hemianopsia in the other. He died about three or four years afterwards. Before death there was complete atrophy in both eyes. The question arises, whether recovery of the field of vision would have taken place if he had or had not given up his dissipations.

Dr. Robert Tilley would be inclined to consider the case hysterical. A case was reported a long time ago by him of left lateral hemianopsia with injury on the left side of the skull with a well-defined depression of bone. He tried to get the patient to consent to an operation. It was only about four months after the accident had occurred that Dr. Tilley saw him, but he replied with a good deal of consideration that he could dance, play baseball, and run a stationary engine, and that he could get along without an operation. He consulted some neurologists and they did not encourage him.

Dr. C. D. Wescott showed specimens from a case of *Primary Carcinoma of the Conjunctiva*, about which he spoke at a previous meeting in connection with a case reported by Dr. Hotz. An examination made by Dr. Hektoen showed the tumor to be a carcinoma growing from the epithelial layers of the conjunctiva.

RANDOLPH RECOMMENDS FOR "Spring Catarrh," an ointment of salicylic acid, six to ten grains to the ounce of lanolin. It is placed between the lids and rubbed into the conjunctiva by massage on the outside of the lids.

SECTION ON OPHTHALMOLOGY.

COLLEGE OF PHYSICIANS OF PHILADELPHIA.

Meeting April 19, 1898. Dr. Geo. C. Harlan, chairman, in the chair.

Dr. Wendell Reber reported, by invitation, three instances of *Microphthalmos with Excessive Hyperopia and Macular Anomalies* occurring in sisters. The three sisters were aged 10, 8, and 4 respectively. Two other children, aged 6 and 2 years, were immune. The physical and ophthalmoscopic appearances, likewise the history of both parents, were absolutely negative. The clinical features were so similar that only the oldest girl's eyes were described, as follows: A. B., æt. 10, healthy, well nourished, had alternating convergent squint since her third year. She had worn + 5 D. for six years without effect on her squint. Both globes were small and deep set, the palpebral conjunctivæ injected, and the anterior chambers shallow. The radii of corneal curvature were: R. E., 6.84 mm.; L. E., 6.83 mm. Both optic nerves were healthy, but in the macular and perimacular regions was found a dull gray area about one disk's diameter in extent, homogeneously granular in appearance and emitting no macular reflex. This area shaded off almost insensibly into the surrounding retina, exhibited no pigment heapings or streaks anywhere, and was skirted below and to the nasal side by a few small yellowish bodies, suggestive of the degeneration bodies seen in albuminuric retinitis. The refraction with the shadow test was: R. E., + 14.75 D. S. ○ + 1.00 D. Cyl. Ax. 70°; L. E., + 14.75 D. S. ○ + 1.00 D. Cyl. Ax. 70°. In the eight-year-old child the radii of corneal curvature were: R. E., 7.07 mm.; L.E., 7.10 mm. Shadow test of her eyes showed: R. E., + 11.50 D. S. ○ + 1.00 D. Cyl. Ax. 80°; L. E., + 11.00 D. S. ○ + 1.00 D. Cyl. Ax. 100°. Shadow test of the four-year-old child's showed: R. E., + 13.00 D. S. ○ + 1.00 D. Cyl. Ax. 90°; L. E., + 13.00 D. S. ○ + 1.50 D. Cyl. Ax. 90°. The absence of all signs of pre-existing inflammation, together with the congenital malformation of the globes in all of the cases, constrained the author to believe in the congenital origin of the macular conditions, and that they in all likelihood represented an arrest of development.

Discussion.—Dr. Edward Jackson had seen a number of cases of hyperopia of almost as high a degree as those described, but none higher. In one case the correcting lenses were: R., + 14, ○ + 2, Cy. Ax. 180°;

L., + 13 ◯ + 2, Cy. Ax. 180°; the greater radius of curvature for each cornea being 7.85 mm. He recalled no case of squint with hyperopia of 10 D. or upward, although intermittent squint was very common with hyperopia of from 4 to 6 D. Dr. Risley suggested that the squint in the cases described probably was due to the macular changes quite as much as to the hyperopia.

Dr. Louis F. Love presented, by invitation, a case in which a *Foreign Body was Successfully Located by the X-Rays and Removed by the Magnet.* The patient was struck in the left eye with a fragment of a rivet while chopping old iron. The upper lid was cut through, the conjunctiva edematous, the sclera and cornea incised, the vitreous protruded, the iris prolapsed, the aqueous was turbid, and the ciliary region was tender on pressure. The vision equaled faint light perception, and all fundus reflex was lost. The body was located in the upper portion of the ball just back of the equator by Dr. Wm. M. Sweet in a series of skiagraphs. Under ether and antisepsis an attempt was made to reach the body with a Hirschberg magnet, the old wound being enlarged for this purpose. After several failures, because of inflammatory exudations, the attempt was abandoned. A large amount of thin, bloody serum poured from the globe during the operation, so that the ball almost collapsed. The following day the globe had regained its shape, and the eye appeared in good condition. The patient was again sent to Dr. Sweet, who reported that the foreign body was in the same position as when the first skiagraphs were taken. Two days later another effort to extract with the magnet was made through an opening made at the equator just under the indicated location. After several attempts, the fragment of iron was finally removed. The patient experienced little pain, and the wound healed readily, leaving the globe in fairly good condition. Dr. Love exhibited a second case, similar in many respects. A man was struck in the right eye with a small piece of steel, as he thinks, while trying to knock a hoop from a cask with a chisel. There is a scar on the cornea to the nasal side and in the inferior quadrant, and the anterior chamber is slightly shallowed. The foreign body penetrated the cornea in the lower nasal quadrant, and passed through the iris, leaving an oval horizontal hole in the tissue about 1 mm. in diameter. Tension is normal, and the eye is white and quiet. Atropin dilated the pupil fully and evenly. The capsule showed the star-shaped entrance of the foreign body and a small collection of rust, and the lens was opaque. With the ophthalmoscope a small portion inferiorly of the eye ground could be made out, but the foreign body could not be seen. Since the injury, the patient states that the left eye is irritable, and that the sight is diminished, but I fail to find any evidence of sympathetic irritation. From the old and rusty chisel a piece of the steel about the size of wound in the iris had been chipped off from its end. Several skiagraphs were taken by Dr. Sweet, but the foreign body cast no shadows and could not be located.

Dr. Geo. E. de Schweinitz reported a *Piece of Steel in the Vitreous Located by the Roentgen Rays According to Sweet's Method and its Removal with the Electro-magnet.* The steel had penetrated near the center of the cornea, passed through the lens, and rendered the media so opaque that ophthalmoscopic examination was impossible; indeed, the lens had already become entirely cataractous. A radiographic examination by Dr. Sweet indicated a piece of metal about 3 mm. long and 1 mm. wide situated 3 mm. behind the horizontal plane of the globe, nearly 2 mm. to the nasal side and 23 mm. back of the center of the cornea. An incision was made through the sclera just below the lower margin of the external rectus, and the broad, flat extension point of a Hirschberg magnet introduced for 15 mm., so as to bring it as nearly as could be calculated over the position of the macula. On withdrawing the extension point, a piece of steel of triangular shape, of the size indicated, and weighing $\frac{1}{7}$ of a grain, was found adherent to it. The scleral wound was closed with catgut sutures and the conjunctiva with interrupted silk sutures.

Three weeks after the operation the eye was still much injected and the tension raised owing to swelling of the lenticular body. The light perception, however, is good in all portions of the field, and under treatment this condition appears to be subsiding, although the likelihood of later enucleation is not remote.

Dr. Edward Jackson urged the advantages and safety of *Illumination by Direct Sunlight for Ophthalmoscopic Examination* in certain cases. The fear of injury to the retina from such an illumination was not well grounded. Practically, the only cases injured by concentrated sunlight are those in which the sun has been steadily looked at for many seconds, or even minutes, as during an eclipse. And in many of these no visible changes occur in the retina, and ultimately normal vision is regained. The method is of value chiefly when the haziness of the media prevents a view of the fundus by ordinary illumination. In such cases the diffusion of light by an unclear medium prevents any possibility of its injurious concentration on the retina. Such illumination had been the greatest value in revealing the presence or absence of suspected intra-ocular tumors and the condition of the vitreous and fundus in cases of diffuse partial opacity of the crystalline lens and cornea.

Dr. de Schweinitz reported a case of *Partial Optic Nerve Atrophy and Central Scotomas* (*So-Called Central Amblyopia*), *Apparently due to Chronic Lead Poisoning* in a house-painter aged 35, whose failing vision was found to be due to a partial atrophy of each optic nerve, associated with central scotomas of the relative type. The ordinary constitutional causes of retrobulbar neuritis were not present, neither could the scotomas be attributed clearly to tobacco or alcohol, which had not been used by the patient for some time before his examination. Both qualitative and quantitative examination of the urine revealed the presence of lead, 8 mg. of the pure metal having been obtained from a 24-hour specimen. The only other symptom of chronic lead poisoning was persistent constipation. There was neither a blue line on the gums nor a blue patch on the mucous membrane of the lips.

Dr. de Schweinitz reported another case of partial atrophy of the optic nerves with central scotomas, relative in one eye and absolute in the other, and with the ophthalmoscopic appearances of atrophy and well-marked perivasculitis of the retinal vessels for which no adequate cause could be found. The man had been a house-painter, but the examination of the urine failed to reveal lead. There was, however, a blue line, somewhat faintly marked, around the lateral incisors of the upper jaw and the left lower canine tooth. No other symptom of chronic lead poisoning was present, and the gingival line was too faint to be pathognomonic.

Dr. C. A. Veasey reported a case of *Central Amblyopia in a Dye-Worker, Probably Produced by Inhalation of the Anilin Dyes.* The patient, a male, 53 years of age, had noticed gradually failing vision for two months. Two years before coming under observation there had been right facial paralysis, but recovery had been complete with the exception of a slight weakness of the orbicularis palpebrarum. There had never been diplopia, and the pupils were equal in size, 4 mm. in diameter, and normal in their reactions. The patient had lost nearly all of his teeth, and there was ulceration of the buccal and nasal mucous membranes, which was thought to have been produced by bichromate of potassium. There was no history of the use of alcohol, and about one ounce of mild smoking tobacco was used in a week. Specific history was denied. R. and L. = $\frac{5}{12}$, improved to $\frac{5}{5}$ dimly, by his correcting glasses. Accommodation normal; orthophoria. The patient had a low-grade optic neuritis and concentric contraction for form and colors. There was a large outward and upward fan-shaped central scotoma for red and green in each eye, occupying nearly a quadrant of the central area of the field. The patient had worked in dye works for twelve years, and for the last seven years of this time had been a "weigher." It was his duty to weigh and dispense the different ingredients from which the dyes were mixed, and in doing so he was obliged to remain in a small room with comparatively no ventilation for two or more hours every day. There was a considerable amount of dust, consequent upon the handling of the chemicals, which kept the atmosphere "as thick as smoke," and the inhalation of this produced symptoms so severe at times that he almost choked. The following chemicals were employed: Chloride of ammonium, carbonate of sodium, sulphate of copper, sulphate of iron, bichromate of potassium, chlorate of potassium, and the anilin dyes. Inasmuch as no record could be found of any case of central amblyopia produced by any of the above chemicals, excepting the last, when there is no accompanying nephritic condition, it is argued that the anilin was probably the cause. The urinary examination in the above case was negative. After using a respirator for a while, aided by the internal administration of strychnin, the patient's visual acuity was much improved.

Discussion.—Dr. Harlan remarked that the absence of lead in the urine is not proof that lead amblyopia is not present.

Dr. George Friebis exhibited a patient on whom he had operated by *Iridectomy for Large Central Corneal Leucoma* and anterior synechia, the result of extensive ulceration in ophthalmia neonatorum. Vision had been improved from counting fingers at 1½ m. to $\frac{5}{30}$.

Dr. Howard Mellor reported, by invitation, two cases of *Retained Sheath* of the *Hyaloid Artery*, in one extending from the disk to the lens. In Case 1 the right eye is divergent V = $\frac{6}{150}$. On the nasal half of the disk is a yellow mass springing from near the center of the disk, extending onto the retina in radiating lines with slight amount of pigment. This mass completely obscures the central excavation and the entrance of the central vessels. It is abundantly supplied with blood-vessels. Originating from this mass near the nasal side of the disk is a spindle-shaped body of a pale green hue extending into the vitreous about a disk diameter in length and continuing straight forward as a gray line to the nasal side of the posterior surface of the lens, where it spreads into a cone-shaped body with numerous fine hair-like projections dipping backward into the vitreous. In addition, several small gray bodies resembling cysts, attached to the spindle-shaped mass by fine threads, are floating in the vitreous. This spindle and thread are evidently the remains of the sheath of the hyaloid artery due, according to Hess, to an atypical embryonic development of the mesoblastic tissue from which it is derived. This patient had a positive absolute central scotoma without apparent changes in the macular region arising from congenital defects in the macular fibers. The field for form and color is irregular and contracted in the lower inner section. The left eye is normal in all respects. In Case 2 there is a small transparent rod or tube running directly forward about three-quarters of a disk diameter in length, tortuous, with three small branches extending into the vitreous. Without close inspection this remnant of the hyaloid sheath could easily be overlooked.

Discussion.—Dr. Veasey recalled a case of persistent hyaloid artery extending from the disk to the lens, in a woman 22 years of age, who had eighteen diopters of myopia with a large posterior staphyloma and considerable disturbance of the choroid. The hyaloid artery extended from the central artery of the retina, as it emerged from the physiologic cup, in a zigzag manner, as far forward as the posterior pole of the lens. At each of the angles there was a number of filaments given off that looked as if they might have been shriveled branches. The patient's vision was so bad that no field was taken. No pulsation could be produced in the artery by pressure. Dr. Risley had seen many cases that have not been published, and he considered the retained nerve-sheath as rather a common condition. Dr. Jackson confirmed Mittendorf's statement, that the commonest form, occurring once in forty or fifty patients, is a dark speck on the posterior lens capsule. The distinct vessels and surrounding tissue are comparatively rare.

HOWARD F. HANSELL, *Clerk of Section.*

A REPORT OF THE PROCEEDINGS OF THE SECTION ON OPHTHALMOLOGY OF THE AMERICAN MEDICAL ASSOCIATION.

FIFTY-FIRST ANNUAL MEETING HELD AT DENVER, COLORADO, JUNE 7TH TO 11TH, 1898.

BY H. V. WÜRDEMANN, M.D.
MILWAUKEE, WIS.

The meeting of the Section on Ophthalmology was held in the club room of the Brown Palace Hotel, there being seventy-five members registered. Dr. Harold Gifford, of Omaha, presided; Dr. R. L. Randolph, of Baltimore, Secretary.

First Day, June 7th.

The meeting was called to order at 2 P. M. Leartus Connor, of Detroit, and G. M. Gould, of Philadelphia, were appointed on the

Executive Committee in place of absent members. The President stated that as it has been a rule of the Executive Committee that no paper should occupy longer than ten minutes in its reading, and that a motion to extend the time of reading any paper should be out of order; he made an order that ten minutes would be allowed for each paper and five minutes for discussion, no person to speak twice in one discussion.

The Chairman, *Harold Gifford, of Omaha, Neb.*, gave an address upon "*The Predominance of German Influence upon Modern Medicine and Surgery*," accounting for the predominance of German work in original research by reason of the university system there prevalent; professors in one German university frequently being called to another city. Particular commendation was given to the character and accomplishments of the Privatdocent. The distinctive features for the requirements of a candidate for the professorship in medicine are the high standards required before claims to preferment are considered. The practice of calling professors of lower grades from other universities and advancing them in their standing is a continual stimulus for original investigation.

J. L. Thompson, of Indianapolis, Ind.—"*Glioma of the Retina*"—stated that in the Eye Section of the Ninth International Medical Congress, an eminent eye specialist of Paris declared that out of 50,000 patients, he had seen but four cases of glioma of the retina. Thompson's private records from 1871 to 1898, inclusive, showed 24,500 eye cases, with 13 cases of glioma of the retina. Besides which, there were four others, brothers and sisters of one of the patients, all of whom died of gliomatous tumors commencing in the eye and subsequently affecting the brain. He questioned whether climate, soil or temperament had anything to do with its causation. Two of his patients were of German parents, one negro; all others American and their parents native born. All but one family had lived long in Indiana. The one from out of the state was from Illinois; both states contain very flat lands. Ten were boys and seven girls; the right eye affected in thirteen, the left in two; both in one patient, and in one the eye affected not specified. In seven the eyes were not removed, and all of these died within a year after examination. Ten eyes were removed, but three of them too late to expect anything except relief of pain. Three of these are known to be cured, and possibly four. One, who had the enucleation eleven days before reading of the paper, will doubtless die, as the optic nerve and orbital tissues are affected. Three of these patients were sent to him supposed to have cataract. All of the cases were unmistakably gliomatous tumors, not only diagnosticated microscopically but specimens sent to skilled pathologists and microscopists, who concurred in the diagnosis. He cannot conceive of the possibility of a mistake being made by one skilled in the use of the ophthalmoscope, between true gliomata and disease resulting from inflammation of the choroid and retina. "Pseudo-glioma" is a misnomer, and should have no place in ophthalmic literature. He believes that glioma of the retina is not necessarily fatal, and that many cases have been and can be cured by early enucleation.

C. R. Holmes, of Cincinnati, Ohio, had seen four cases, of which three were not operated upon in time. In one case, in which the eye was enucleated one year ago, there has not yet been the slightest return, but statistics prove that this is not sufficient time to pronounce a true recovery. There is a question whether glioma should not be classified with the sarcomata. It is claimed that glioma arises from the inner granular layer of the retina, but there is now a desire to reclassify this tumor with sarcoma, although recent German authors still classify it by the old name. Early enucleation must be demanded, or the surgeon should refuse to have anything more to do with the case.

Frank Allport, of Chicago, Ill., had seen two cases of glioma of the retina, both being diagnosed microscopically as glioma, and both occurring in children of three years of age. In the first the eyeball was enucleated about six years ago. The child is now well and has never had any recurrence. In the other case the glioma had perforated the globe, before the eyeball was removed. The child died of recurrence about one year later.

J. E. Minney, of Topeka, Kan., had seen four cases, two of which were living. One in a girl twelve years of age, which had been seen six years ago, who had glioma in both eyes. One was painful and was removed, being submitted to a pathologist and proven to be characteristic glioma. The other eye was affected seemingly in the same way, total blindness occurring within six months. This eye was then removed. The girl is now in a blind asylum, four years having elapsed without recurrence.

E. C. Ellet, of Memphis, Tenn., had two cases, in one of which both eyes were enucleated for double glioma. There has been no recurrence in eight years. In the other case, a child two years of age, seen first in April, 1897, with history that almost since birth the right eye was noticed to be enlarged and the pupil to be white. Six weeks before examination the eye began to shrink, but there was very little inflammation. At first the case was thought to be retinal detachment, the ball being small and soft. In September, 1897, the same process began in the other eye, it becoming enlarged. A diagnosis was then made of glioma of that eye. In the right eye there was no evidence of further advancement of the process.

Garten of Lincoln, Neb., said that it was a remarkable fact that the eminent French specialist referred to by Thompson had seen 50,000 eye cases and but three of glioma. His own impression was that it was much more prevalent. He had four cases which should be considered glioma, two of which had died and two had recovered. The question is: Are we right in our diagnosis?

T. A. Grigg, of Butte, Mont., asked whether in operating for glioma the members enucleated the eye only or removed the entire orbital contents. The latter procedure gives the best hopes of a non-recurrence. He had one case two years ago in which the disease had not returned and one three months ago.

H. V. Würdemann, of Milwaukee, Wis., was pleased to learn of such a large percentage of recoveries after operation in Thompson's large experience, which, no doubt, was greater than the majority of the members present. In ten years he has seen five cases of glioma of the retina, three of which came to operation. All of these cases have died within six months after the diagnosis was first made. The trouble with cases of intraocular tumors is that they usually apply for relief too late for a favorable prognosis to be given as regards life. If the enucleation be practiced before infiltration has proceeded further than the eyeball, favorable prognosis may be given. Patients usually apply when the symptoms of great pain, inflammation and increased tension have occurred and are so severe that it is absolutely necessary to secure relief. This is generally too late to insure non-recurrence after operation. This is as true of glioma as of other intraocular tumors, as the parents only appreciate the gravity of the affection in its later stages. The diagnosis between glioma and so-called pseudo-glioma, the latter condition resulting from intraocular inflammation, should be readily made, although there are a number of inflammatory affections of the eye which, on ophthalmoscopic examination, may have the appearance of glioma. The diagnosis is readily made from the history and the present condition; in glioma there being a typical rugous tumor in which the blood vessels may be observed, a characteristic color, and in the later stages always tension until perforation ensues. The outcome proves the diagnosis; all glioma cases are fatal within two years unless all of the infiltrated tissue be removed. He showed a macroscopic specimen of an eyeball completely filled with a gliomatous tumor, although perforation had not occurred. All of the structures of the eyeball were infiltrated, the optic nerve and its lymph sheaths. The specimen well showed the conditions which ensued after the disease had lasted some time and the causes of extension into the orbit and brain. This case was diagnosed in its incipiency, but operation refused, three months later the parents applying again, and the operation was done under protest, without expectation of life. The tumor re-formed a few weeks later in the orbit in a large fungus mass. Exenteration was done by another surgeon, but death resulted after this last operation.

C. H. Beard, of Chicago, Ill., had seen several cases of glioma upon which no report has yet been made, in only one of which he obtained microscopic examination. This was in a child less than two years of age, and after several years there has been no recurrence, the case being yet under observation.

Cassius Wescott, of Chicago, Ill., had seen one case in which the clinical diagnosis of glioma was made, occurring in a child three and one-half years of age, the appearances being typical, there being tension and pain. Microscopic examination demonstrated that the tumor was a non-pigmented sarcoma of the choroid. The tumor cells infiltrated the optic nerve, and three months later, on account of recurrence, he exenterated the orbit, the child dying six months later.

J. O. McReynolds, of Dallas, Tex., had seen five cases, three of which were fatal, two of them probably being pseudo-glioma. In one case, examination of the eye after enucleation was recognized as a pseudo-glioma, the growth having been in progress for four or five years. He saw the patient a week ago and performed operation for adenoids, there being at that time no recurrence of the ocular growth.

H. M. Starkey, of Chicago, Ill., showed macroscopic specimen of an eye enucleated for glioma from a child. The tumor partially filled the eyeball. The eye was enucleated one year ago, but the patient is now alive and no recurrence has taken place. In his experience, cases were not so rare as had been stated. He has operated upon two cases which have not recurred. In the case of the child from which the specimen presented was made, there has been no recurrence for one and a half years. In another case there has been no recurrence for six or eight years.

Dudley S. Reynolds, of Louisville, Ky., had seen more than a dozen cases of glioma of the retina, his first case being in 1869. The child then had sight in the eye, but ophthalmoscopic examination showed a yellowish reflex, the pupil being slightly shaded. A golden yellow tumor was found not far from the optic nerve entrance. Two weeks later the tumor had almost doubled in size. Enucleation was then done. The other eye was not affected until 1873; was then sensitive, and ophthalmoscopic examination showed the same kind of a golden colored tumor, and enucleation shortly after was practiced. True neuro-sarcoma or glioma begins in the retina, affects the choroid, and proceeds into the vitreous chamber. Pseudo-glioma means something else and not glioma. Choroidal sarcoma and cancerous growths usually arise in the choroid, and extend farther to the tissues of the orbit and optic nerve. In one case of a blacksmith, sixty years of age, a tumor as large as his head protruded from the orbit. Extirpation of the growth and exenteration of the entire contents of the orbit was made. Recovery followed, and he was healthy for five years. The tumor again re-formed and he died of cancer of the brain. Microscopic examination showed sarcoma of the optic nerve and brain. He has enucleated many eyes for glioma, but knows of no complete recovery.

H. B. Young, of Burlington, Iowa, said that in a practice of ten years he had never seen a case of glioma of the retina.

Flavel B. Tiffany, of Kansas City, Mo., in an experience of twenty years, recalled eight cases of glioma, three of which were double. All were under seven years of age, and it is recognized that glioma only appears in young children. All of his cases were negroes excepting two, and he thinks that this disease appears more frequently in the negro than in the white, and this fact might account for our seeing more cases than are seen in Europe. When the eye is ruptured and the tumor protruding, he exenterates all the orbital contents, but if the tumor is confined to the eye, he only enucleates.

F. D. Boyd, of San Antonio, Texas, had seen one case of glioma of the retina which had died. The father and mother were healthy. They had five children, three of which had died from eye disease.

Robert F. Le Mond, of Denver, Colo., had seen few cases of glioma of the retina, and does not agree with authorities that it commonly occurs in the young, as in his cases one was fifty-two, one fifty-five, and the third, now under treatment, fifty-three. He operated upon two of them and one died.

Herbert Harlan, of Baltimore, Md., agreed upon the necessity of having the operation performed early. In one case now under observation he has had trouble on that account. Last March the mother noticed something white in both pupils of her eight-year-old girl. The pupils were partly dilated and the child could yet see objects. Diagnosis of glioma in both eyes was made. The tension was high. He has since seen the child every three weeks and there is now only perception of light. Both the pupils react strongly. This child is the daughter of a very intelligent physician, who understands the matter thoroughly, having had the opinion of three oculists, and yet he declines to allow interference in any way. While it is well to advise operation, it seems that in many cases it is impossible to do what we think best.

D. C. Bryant, of Omaha, Neb., had seen half a dozen cases, in three of which perforation had taken place, but before extensive growth appeared. In all three cases the contents of the orbit were removed, but in a short time death followed. The others were non-perforating cases. In two the eyeball was enucleated. In two of these recurrence and death followed. In the remaining case the eyeball was enucleated four years ago, and there has not been any recurrence. The case was one and a-half years old when first seen.

R. L. Randolph, of Baltimore, Md., said that Greef had recently made some observations in regard to the histology of these tumors which he has been able to confirm. Randolph has noticed that in sections of gliomata stained with hæmatoxylin the cells immediately about the blood vessels are more deeply stained than those lying at points remote. This gives to the tumor almost the appearance of angioma. This condition is to be accounted for in a large measure by the high intraocular tension, which has the effect of squeezing out the life of the cells remote from the blood vessels, and consequently these cells appear in the sections necrotic, while those surrounding the vessel retain their vitality and stain deeply. Recent work has shown that the tumor does not originate, as was once thought, from the external, or from the internal granular layers. It will be remembered that the cells in a glioma morphologically resemble those in the granular layers of the retina, and this seemed a strong reason for supposing that here the tumor originated. Improved methods of staining, however, have shown that the tumor cells are not only like those in the granular layers, but that they are of different sizes and shapes, some being oval and some having processes and resembling a rosette. The theory as to the origin of these tumors is new. It is not an uncommon thing to find in a normal retina cells which are out of place, that is to say, cells in one layer which morphologically belong in another layer, as, for instance, ganglion cells in the internal granular layer, and vice versa. These cells have been called by Cajal, Wintersteiner, Greef and others, misplaced cells, and these observers have noted that gliomata are made up largely of these misplaced cells. The conclusion is then that a glioma originates from a cell which is misplaced in fœtal life, and which misplacement may occur in any one of the retinal layers.

J. L. Thompson, of Indianapolis, Ind., in closing discussion, stated that in his experience recurrence has occurred within seven months in those cases which died. He never had a patient with glioma who was over six years of age. He knows of tumor after tumor of the sarcomatous type which occurred after seven years of age. He does not exenterate the orbit if the tumor is only within the eyeball. He cuts the nerve far back, but if the tumor has passed out of the globe he then exenterates the orbit. He cannot conceive of persons confusing glioma with detachment of the retina if the case is seen in private practice. Of course, in hospital practice, a snap diagnosis might allow of such a mistake. In his paper he referred to glioma, and not to pseudo-glioma. He advises early operation in all cases, and he tells the parents that the children will surely die if it is not done.

Geo. M. Gould, of Philadelphia, Pa.—"*A Case of Mathematically Perfect Eyes.*"—The patient was a healthy man of fifty years of age, who had been greatly troubled with frequent severe subconjunctival hemorrhages. Several oculists had refused to order glasses because the man had what was pronounced a "pair of mathematically perfect eyes." They had not, however, used a mydriatic to make this diagnosis, and mydriasis served to reveal a low grade of simple myopic astigmatism at reversed axes. The correction of this defect ended the hemorrhages, and gave the greatest satisfaction to the patient.

Cassius Wescott, of Chicago, Ill., uses a mydriatic in persons as high as sixty-four years of age and believes that the more he uses homatropin in patients over forty-five the more satisfactory his results. He agrees with Gould that it is important to recognize astigmatism of the lens after the age of presbyopia.

J. E. Minney, of Topeka, Kansas, said that he had personally a small error of refraction, and he was two years getting this satisfactorily corrected. Referring to Gould's case, he believed the blood vessels of the eyes were not normal, and he suspected that there would probably be some future brain lesion, and the patient should be put on his guard.

G. C. Savage, of Nashville, Tenn.—The question why astigmatism should be more troublesome when it is vertical in one eye and horizontal in the other has not yet been fully set forth. This is due to the fact that the visual axes fail to work together and throw upon the recti muscles the necessity for correcting their relative movements. We know that the image is elongated in the greatest diameter of curvature, and if it be elongated horizontally in one eye and vertically in the other it causes irregular action of the recti muscles. If one eye is directed to the center of the object in order that the other may work in harmony, the muscle of that eye is called upon to extra effort, and if one has to go so far and the other farther, you can see that there is at once a disturbance of this harmony. He therefore believes that astigmatism against the rule in one eye and according to the rule in the other is of more importance to the patient on this account.

Harold Gifford, of Omaha, Neb., had started out as a confirmed skeptic concerning the value of a .25 D. lens, but had obtained a good result in the case of a homeopathic oculist by prescribing a correcting glass of .12 D.

G. M. Gould, of Philadelphia, Pa., in closing the discussion read a postscript attached to his paper of a case reported to him by H. O. Reik, of Baltimore, in which recurrent sub-conjunctival hemorrhage in a case of a lady aged thirty years was cured by wearing minus .50 D, 90 deg. R. and minus .50 D., 180 deg. L. It is noteworthy that the error causing the trouble in both cases was a low degree of myopic astigmatism at reversed axes.

H. M. Starkey, of Chicago, Ill.—"*The Galvanic Current for the Treatment of Pterygium*"—since 1890 has been treating small pterygia, not encroaching much upon the cornea, with a weak galvanic current. Nineteen cases have been so treated in private practice and about an equal number in hospital and dispensary. S. J. F., male, age 36, September 13, 1889, had a small vascular pterygium just commencing to encroach upon the inner border of the cornea of the right eye. The pterygium was supposed to have been caused by a particle of steel which wounded the eye thirteen years previously. The enlarged blood vessels in the growth at once suggested that electrolysis might be profitably employed for its removal. The patient promised to return in a few days for treatment, but was not seen again until June 2, 1890, when he returned and consented to have electricity tried for the removal of the growth. A platinum needle, as the positive pole, was passed through the pterygium in three lines, 2 mm. apart, and a current of three milliamperes was passed for one minute at each place. The application caused the large vessels to disappear, and also caused considerable puffiness at the lines of puncture from escape of gas into the meshes of the subjunctival connective tissue. The patient was to have returned in a few days for further treatment, but was not seen for nearly a year, when he was met upon the street. The pterygium was then seen to have entirely disappeared, only slight thickening of the conjunctiva remaining, and this was firmly adherent to the sclera. The patient was seen from time to time until 1896, when he passed from observation. Through these six years the condition remained unchanged, notwithstanding he had several mild attacks of conjunctivitis.

In about 20 per cent. of the cases the growth, though reduced in size by the electrolysis, has later commenced to increase in size, and some form of operation has been necessary for its removal; in about 30 per cent. the growth has been much diminished and has shown no tendency to increase subsequently; while in about 50 per cent. the growth has entirely disappeared, or as little has been left as is found after the most approved operation.

The cases which seem to be suitable for electrolysis are those with small pterygia, not encroaching much upon the cornea, and particularly those in which there is considerable enlargement of blood vessels.

The electrolytic current destroys the blood vessels, it causes adhesive inflammation, gluing the conjunctiva to the sclera, and it destroys micro-organism, in its course.

The positive pole is employed, from one to three milliamperes of current are required, and the operation must be repeated two or three times. Under cocain anesthesia this is painless.

The advantages of this method are: First, it avoids any loss of tissue; second, it is painless; third, it does not incapacitate the patient; fourth, it stops the progress of pterygia seen in the early stages. With these advantages is coupled the fact that it seems quite as free from recurrences as any other method. It is not advised except as a palliative in broad, fleshy pterygia, or in those encroaching much upon the cornea.

Robert F. Le Mond, of Denver, Colo.—"*Galvanism in Choroiditis.*"

F. T. Rogers, Providence, R. I., criticised the indefinite terms used by Le Mond in describing the use of electricity. To say that twelve cells were used does not mean anything, for a cell may measure four milliamperes or it may measure 15. The milliampere is the important factor and not the number of cells used. As a matter of experiment he knows that three to four milliamperes of current is all that can be used to the eye.

J. E. Minney, Topeka, Kan., thought that the secret of the successful treatment was due to the large doses of anti-syphilitics which had been given.

C. E. Norton, Lewiston, Me., said that in electrolysis the negative pole gave the bubbles of gas and the needle is extracted with some difficulty, as it is held firmly by the hardened tissues.

Leartus Connor, of Detroit, Mich., had used electrolosis in two cases of choroiditis, but was unable to determine whether or not appreciable effect for good or evil had been made on the course of the disease.

George M. Gould, of Philadelphia, Pa., said that Doctor Oliver of Brooklyn was several years ago interested in clearing up corneal opacities by electricity. He was then enthusiastic and showed several cases which had improved in vision. On visiting him again last year he said that he was not keeping up this treatment, as the patients grew very tired before much could be accomplished and gave it up. He did not apply more than one to three milliamperes at a time.

R. L. Randolph, of Baltimore, Md., had only used electricity in removing eyelashes. This is exceedingly painful there and in many cases fruitless.

G. Melville Black, of Denver, Colo., had at one time written a paper describing the results of the negative pole for reducing the tension in glaucoma. He tried it on four or five cases, in a couple of which partial reduction of tension was apparent. In the other cases there was no action whatever and the use of electricity seemed a waste of time. Electrolysis is useful for the removal of eyelashes.

T. A. Grigg, Butte, Mont., had satisfactory experience of some cases in removing eyelashes by electricity. He applies 5 per cent. cocaine on absorbent cotton to the eyelids, using a very fine needle and a magnifier.

J. O. McReynolds, of Dallas, Texas, said that in his experience the pain of electrolysis in the removal of cilia cannot be prevented, though the operation can be very successful. He has the patient take the positive pole in one hand and inserts the needle well down beside the hair bulb, turns the current on gently, and waits until the bubbles form about the layer, when it can be pulled out by the fingers. If the hair is so firm as to require forceps, it generally reappears. The smaller the hair the more difficult it is to remove.

J. L. Thompson, of Indianapolis, Ind., pointed out the importance of using the positive pole in electrolysis.

H. M. Starkey, of Chicago, Ill., in closing the discussion, called attention to the fact that the negative pole should be used in glaucoma, as this draws fluids from the tissue and lessens tension. The reverse process might readily in some cases produce glaucoma, especially in elderly persons. The reason why gas forms at the positive pole in electrolysis is on account of decomposition of the water of the tissues. He has used the negative pole in dissolving cicatrices. In the operation for pterygium the direction of the needle is at right angles to the growth. In corneal opacity he uses the negative pole because the dissolving action is wished. He has caused intense reaction sometimes from even one-quarter or one-half milliampere.

R. F. Le Mond, of Denver, Colo., stated that he was almost assured that many would not agree with him. He has used kali-iodide and bi-chloride in a number of cases without any results, in one of which the patient had claimed she had gone blind under the treatment. He then used electrolysis with slow improvement.

Dudley S. Reynolds, of Louisville, Ky.,—"Phlyctenular Keratitis,"—presented a series of observations from the Hospital College of Medicine at Louisville, Ky., extending through the first one thousand names on the clinical list, beginning August 25, 1894, ending August 24, 1897.

There are in this list forty-four cases of phlyctenular keratitis. In twelve of these forty-four persons phlyctenular conjunctivitis co-existed at the time of registration. In fourteen of the cases phlyctenular conjunctivitis subsequently appeared, at varying periods of two to twenty-seven months from the date of the first attack. In but three of these people did keratitis reappear. In five eczema nasalis was present as a complication at the beginning. In two other cases it appeared subsequently. In five persons blepharitis marginalis was present as a complication in the beginning. In three other persons blepharitis marginalis occurred subsequently. In one case iritis, with phlyctenular conjunctivitis, appeared twenty-one months after the phlyctenular keratitis. In the whole forty-four persons not one received any local treatment whatever during the continuance of the phlyctenular keratitis. The greatest period of treatment extended through three weeks; the shortest period five days. In every case bi-chloride of mercury and sulphate of quinine were relied upon, with such additions as were suggested by complicating states of the patient's general health. Constipation being overcome by saline aperients and by regulation of the diet and habits of the patient. Those cases amenable to discipline, and which could be traced after a lapse of three years' time, are alone included in the table. In every case lymphatic engorgement or other manifestations of the strumous diathesis were present. Blepharo-spasm and photophobia were often relieved by a single dose of Rochelle salts or anti-periodic dose of sulphate of quinine. A child of from seven to fourteen years of age after an aperient may take a single dose of 10 gr. of sulphate of quinine with marked amelioration of the condition of the eye. The subsequent treatment should include both mercury and sulphate of quinine in minute doses. For a child under ten years of age 1-10 gr. of sulphate of quinine and 1-50 gr. of bi-chloride of mercury may be given together every hour, every two hours or every three hours, according to the intensity of the blepharo-spasm and photophobia. Above ten years of age ¼ gr. of sulphate of quinine should be given with 1.50 gr. of bi-chloride of mercury every hour, every two hours or every three hours, according to the urgency of the symptoms.

Eczematous eruptions of the face and scalp yield promptly to the application of amoniated mercury. Similar eruptions in the anterior nares are relieved by a mixture of yellow oxide of mercury ointment and liquid pitch; whilst muco-purulent inflammations of the Schneiderian membrane demand the use of sprays, the best of which contain bi-chloride of mercury and chloride of sodium. Where a tendency to inspissation of accumulating matters in the nasal passages exists, a powder composed of borate of sodium ½ oz., chloride of sodium 10 gr., camphor 15 gr., may be advantageously employed as a snuff frequently during the day. Children under twelve years of age, however, are not likely to use the snuff; in such cases an aqueous spray of borate of sodium 2½ dr., chloride of sodium ½ dr., distilled water 8 oz., camphor water and mint water each 4 oz., carbolic acid in crystals 4 gr. This mixture makes a most agreeable spray, and is valuable not only as a cleansing fluid, but is soothing and agreeable to the sensibilities of the patient, and the child which at first rebels at the use of the spray will usually in a day or two not only yield without contest, but often seek an application.

Horner's notion of the relations existing between eczematous eruptions of the skin and anterior nares to the phlyctenular diseases of childhood is not always apparent, but nearly constant. The conditions which predispose to these local disturbances are essentially constitutional, and no local treatment is, in any large proportion of cases, to be regarded with favor. Per contra, constitutional measures are of the first importance and may alone be relied upon, even in complicated cases, so far as the eye is concerned as a participating organ.

C. R. Holmes, of Cincinnati, Ohio, stated that unless cases of phlyctenular keratitis were treated as Dr. Reynolds had suggested, the results were not satisfactory. Good men have treated them locally without results because they neglected the nose and constitutional symptoms and relied too much upon the local treatment. He uses more local treatment than advocated by Reynolds. He gives weak solution of eserin with cocaine instilled into the eye two or three minutes before the yellow ointment is applied. He does not use atropia except in rare cases.

J. L. Thompson, of Indianapolis, Ind., said that in his section of the country they had phlyctenular keratitis from spring until late October.

Constitutional treatment is necessary before all others, and in some cases he advised a change in climate. It is astonishing how quickly a change of climate and diet helps these cases.

F. D. Boyd, of San Antonio, Texas, used quinin and arsenic internally, with atropin and eserin locally. He disparaged the use of cocain.

E. C. Ellett, of Memphis, Tenn.—Although the contiguous country to Memphis is low and swampy, he does not give much weight to the miasmatic theory unless confirmed by examination of the blood. He gives large doses of quinin. He does not see many cases of simple phlyctenular conjunctivitis or keratitis. Regulation of the diet, proper attention to the nose and local treatment by yellow oxid ointment is the customary form of treatment. Many cases are seen in laborers. Corneal diseases of all sorts are common among the negroes. He uses cocain and eserin in ulcerative conditions of the cornea, and has never noticed any destructive effects of importance.

Leartus Connor of Detroit, Mich., had very few cases of phlyctenular disease, and many less since the advantages of the Belle Isle Park in the Detroit River were opened some years ago. He keeps children out of doors as much as possible, but protects the eyes from strong light and dust. The children recover very quickly in the Children's Hospital in Detroit, as it is most perfectly lighted and ventilated. Diet and general condition are made as perfect as possible. He uses atropin rather than eserin, as it is more satisfactory for the pain and irritation, and seldom uses cocain. For general treatment he recommends small doses of calomel, 1-10 gr. three to four times a day, as it increases the quality of the blood.

H. B. Young, of Burlington, Iowa, agrees with Doctor Connor in the blood-making qualities of small doses of calomel, having more benefit from the use of this drug than any other. Generally speaking mercury is not a blood-maker, but in this case we have malnutrition and poor digestion. We use small doses of calomel until we counteract this condition. He advises the preparation of yellow oxid of mercury ointment by rubbing it thoroughly on a glass plate with a spatula in order to thoroughly triturate the preparation.

G. Melville Black, of Denver, Colo.—There are very few cases of phlyctenular keratitis in Denver, mostly occurring in children who are on improper diet. His yellow oxid ointment is prepared with white beeswax and rosewater.

J. L. Hiers, of Savannah, Ga., called attention to treatment of the nasal cavities as well as the constitutional treatment. He uses yellow oxid ointment before the phlyctenule breaks down, but treats the ulcerative form with iodin after cocainization of the eye. Fixing the lids with the speculum, he wipes out the ulceration, and applies tincture of iodin by cotton pledget, afterwards washing the eye out with boric acid solution. To overcome the reaction he places on a pad of cotton wet with boric acid and bandages, keeping it thoroughly saturated for a half-hour and rebandages until the second day. He seldom uses atropin. Has been using iodin in corneal ulcers for three years.

Flavel B. Tiffany, of Kansas City, Mo., has a great many cases of phlyctenular keratitis, going very rarely to his clinic without finding one or two new cases. He has never regarded this disease as being of a malarial nature, but rather as strumous. He finds it among the poorer classes of people, often the offspring of syphilitic parents. He has never used quinin in the treatment of these cases. In systemic treatment, relies mostly upon the syrup of the iodid of iron.

R. F. Le Mond, of Denver, Colo.—These phlyctenular troubles are very largely due to malnutrition and lymphatic engorgement occurring in children whose parents are not strong and who are often syphilitic. There is very little of this trouble in Denver. The majority of cases have suffered with constipation and engorgement of the liver. He gives calomel and a tonic and the phlyctenular trouble soon disappears. He prescribes cocain locally and washes the eye out with 1:5000 to 1:2000 bi-chlorid and afterwards boric acid solution. If an ulcer forms he uses eserin rather than antropin.

J. O. McReynolds, of Dallas, Texas.—There is but little phlyctenular trouble in Texas and when it occurs is never rebellious. This is evidently due to the salubrious climate. In Texas all recognized forms of treatment for phlyctenular keratitis are satisfactory.

J. E. Minney, Topeka, Kan., said the principal points of treatment were, first, air; second, hygiene; third, protection by bandage. He gives 1 gr. of calomel in 10 tablets, one tablet every hour in addition to dusting of the phlyctenule with a mild chlorid, boric acid wash to keep the eye clean and the disease quickly disappears. He has but few cases. One-quarter gr. calomel three time a day will increase the red corpuscles,

Wm. C. Bane, of Denver, Colo., has the yellow oxid of mercury rubbed up with olive oil and added to the ointment, then mixed with vaselin and lanolin.

C. E. Norton, Lewiston, Me., does not believe that this disease originates in malaria and therefore does not use quinin except in patients coming from a malarial region. It usually occurs in children from the lower classes. He prescribes all the food for the child to eat, which is mainly bread and milk. This is better food than anything else and comparatively cheaper. Bandaging keeps in the secretions. He is careful to get the child to open its eyes. The use of cocain relieves the pain.

R. L. Randolph, of Baltimore, Md.—In all forms of keratitis, especially the phlyctenular variety, we have irritative symptoms. In phlyctenular keratitis we have exposure and inflammation of the nerve endings and as a consequence spasm of the accommodation and contracted pupil. It would seem that eserin in such cases would only intensify this condition. Complete rest of the accommodation and removal of the irritative symptoms is demanded, an end which is best obtained through atropin. The more he employs eserin, the more he is convinced of its very limited usefulness outside of its value in glaucoma.

Dudley S. Reynolds, of Louisville, Ky., in closing discussion, gives especial attention to the emunctionaries and the digestion. Sugar and sweets are the worst kind of stimulants for this condition and, together with tea and coffee, are the very kind poor people are prone to use. He orders bread and milk every few hours for young children. In older ones he gives malted milk and beef extract in addition. He allows fresh fruits, insists on pure water and the patient going out of doors, the eyes being protected by smoked glasses.

The Chairman called attention to the macroscopic specimens of eye sections exhibited by *H. V. Würdemann, of Milwaukee.* These consisted of a teaching series of forty eye specimens mounted in gelatin, from the larger birds, fish and animals and characteristic human eye iujuries and diseases, including a full series of tumors.

The Chairman nominated Frank Allport, C. R. Holmes, and H. V. Würdemann upon the nominating committee.

Second Day, Wednesday, June 8th, 9 A. M.

Edward Jackson, of Denver. Colo.—" The Influence of Age in Causing Opacity of the Crystalline Lens."—Among ten thousand patients examined opthalmoscopically at the Philadelphia Polyclinic and Wills Eye Hospital, found that of 1,545 patients upward of fifty years of age, 449 had some lens opacity. Arranged in five-year periods, the percentages showing such opacities were: From fifty to fifty-five, 15 per cent.; from fifty-five to sixty, 16.1 per cent.; sixty to sixty-five, 30.2 per cent.; sixty-five to seventy-five, 77 per cent. Other factors of importance were the influence of eye-strain at the age of presbyopia and the effect on nutrition of acute diseases as grippe.

Renal disease he had found of only minor importance. Age, although evidently an important factor, was to be regarded as constituting a predisposition. In view of the fact that so large a proportion of elderly people presented the condition, it seemed wrong to speak of all cases of lens opacity as cataract, a term associated in the minds of patients with blindness, and the necessity of a serious operation.

F. C. Hotz, of Chicago, Ill., in speaking to patients, is not in the habit of calling slight peripheral opacities of the lens by the term of cataract, because these often remain stationary for a great length of time. In one case of a lady he had recently examined, she said that thirty years ago Doctor Agnew, of New York, said she had cataract in one eye. The present vision of that eye was 20/XL, and only by examination in the dark room could short equatorial streaks in the lens be found. If this patient had gone to some renowned quacks who claim to cure cataract by absorption or electricity, or had employed Christian Science to stay the advancement of blindness, these healers would have claimed that her sight had been thus preserved. It is good advice not to mention the word cataract except in advanced disturbances of lens transparency.

G. C. Savage, of Nashville, Tenn.—The better the nutrition of the ciliary body, the better the nutrition of the lens. It is possible to develop a ciliary muscle as well as any muscle of the body, and, in his own case, he believes that he has been able to put off the advancement of presbyopia by an exercise with lenses. He sits eight to ten feet from the light, turned down, with his spectacles on, and with a minus .50 spherical in a common pair of frames, raises and lowers the lenses at intervals of ten seconds. Although more than a year ago he found it difficult to extract foreign bodies on account of beginning presbyopia, he can now read at a distance of eight inches without any trouble, and expects to do so for quite a while.

Leartus Connor, of Detroit, Mich., disagreed with Savage regarding rejuvination of the ciliary muscle or any part of the body by exercise, as the causation of old age is due to the increase of inorganic matter of the tissues. This ought to be true of the other muscles of the body if it were true of the lens and ciliary body. The contrary is well known. The theory of Savage was equivalent to the prevention of death, which comes from increase of the proportion of intraocular matters in the several organs of the body. The improvement of nutrition in the lens, however, is necessary for the prevention of increase in these opacities. There are under his observation persons in whom he recognized opacities of the lens at periods varying from ten to eighteen years ago, who had at that time errors of refraction which were corrected. The result of the correction and perseverance in wearing glasses has held the opacities. Doctor Risley has called attention to the relation of eye-strain to the production of cataract, having collected a vast amount of statistics in Philadelphia. These showed that the results of correction of the refraction of people in Philadelphia had had an influence upon the diminishment of the number of cataracts. The objection to Jackson's method was that some other person might see the eye and tell the patient that he had cataract, when he would lose faith in the former physician. This is, however, trivial, as friends or relatives may be made acquainted with the condition.

Frank Allport, of Chicago, Ill.—We frequently see cases of lenticular opacity that do not increase from year to year. In one case, of a physician's wife, he noticed considerable opacity at the periphery of the lens in one of her eyes, and on speaking to her about it, said this had been recognized by Doctors Agnew and Knapp twenty-five or thirty years ago, and at that time she was told to prepare for cataract operation in the course of a year or so. She can now see as well as ever. Patients should be told that there is lenticular opacity and their friends that there is cataract. The correct adjustment of glasses and building up the health will in some instances put off the full development of cataract for many years, and it seems too bad to have the patient's mind disturbed unless actually necessary.

Edward Jackson, of Denver, Colo., in closing the discussion, called attention to the case of the mother of a prominent ophthalmologist, who was sixty years of age, and had rapidly lost vision from lenticular opacity. It was expected that in a few months she would be ready for cataract extraction, as all her eye-work ceased. Vision, however, improved so much that she was helped by glasses. She used her eyes freely, reading several hours a day, and does not now suffer from any impairment of vision. The contents of both lenses were almost entirely opaque, but a small tunnel of clear lens substance remains, and has existed for twenty-five years. In almost every case of cataract the progress of the lenticular opacity may be checked. He sometimes tells patients about their eyes, mentioning the word cataract, and discusses what cataract is, to prevent them being frightened by some one else, and has gone out of his way to give them as full an account as possible to make them understand.

Henry Gradle, of Chicago, Ill.—"*A Form of Corneal Turbidity Easily Overlooked.*"—The speaker contended that diffuse cloudiness of the cornea can occur without dimming of the surface lustre, and that this form is not detected by direct inspection, or by the ophthalmoscope, but only by lateral illumination and the use of a strong magnifying lens. It is, indeed, but the exaggeration of the turbidity of the normal cornea. He has observed it in connection with asthenopic complaints not wholly accounted for by the existing ametropia. The complaints were smarting and similar sensations, and a liability to redness of the eyes, and they were either not entirely or at least not promptly relieved by glasses. In those instances which were one-sided, the lid aperature was smaller, the lids a trifle more vascular, and the scleral veins more visible than on the other side. Focal illumination with strong magnification showed the cornea more turbid than in the other eye. It was, however, not a true keratitis, but an irritative condition, the pathology of which is not clear. The corneal turbidity suffices however to reduce sight a trifle below the normal standard. In some instances the condition disappeared with rest, the use of glasses, and the inspersion of calomel; in others it persisted a long time. The writer believes that bilateral cases of this affection are quite common, but that the diagnosis is difficult or indefinite when no comparison can be made between the two eyes.

L. J. Lautenbach, of Philadelphia, Pa.—Any one who uses the ophthalmometer will have noticed a large class of cases of opacity of the cornea not recognizable under ordinary conditions. There is nothing equal to that examination by which we take the incandescent filament and use its curves to indicate the exact curves of the inside of the eye as well as the outside corneal surfaces. It is one of the best ways of carefully studying the cornea. It is like the ophthalmoscope in that it gives us powers we did not possess in any other way. There is an advantage of having the best instruments for bringing out these points. The causation of these cases, seems to me, is dependent upon blood conditions mostly, generally rheumatic or syphilitic.

Edward Jackson, of Denver, Colo., had seen a few cases like these of Gradle's, and agreed with him that eye-strain in hypermetropia yields very satisfactorily to a slow mydriatic, atropin or duboisin. He can recall cases in which the opacity cleared up entirely within four weeks under this treatment. It is perhaps an indication of general disturbance of nutrition.

Harold Gifford, of Omaha, Neb., had never seen a case in which, with the proper illumination you could not see a hazy appearance in the cornea. It is more clearly shown by electric illumination. He has yet to see a normal eye in which this could not be found, but the haze which is seen with the ordinary lens, resolves itself under a +10 D. lens into little clouds. He is sure that this is a normal condition. Where there is a corneal ulcer or foreign body, or the slightest source of irritation, the opacity will be found much larger.

John F. Fulton, of St. Paul, Minn.—This clouding of the cornea is due to strain of some kind, and in many cases is a commencing keratitis. It may not only be due to refractive error, but muscular trouble. It is important to correct the refraction and the muscular condition.

Henry Gradle, of Chicago, Ill., in closing the discussion, explained his method of examination in which he used an ordinary gas burner and threw the light obliquely upon the cornea. The haze can always be resolved in perfectly normal eyes. It is difficult to make a distinction between the turbidity of a normal eye and one slightly diseased.

Ellet O. Sisson, of Keokuk, Iowa, "*Bacteria one of the Chief Etiological Factors in Diseases of the Eye.*"

It is perfectly reasonable to suppose that bacteria should be one of the chief etiological factors in the production of diseased conditions in the eye when we take into consideration the exposed position of the organ. We have the moist surface of the conjunctiva presenting itself and furnishing an excellent lodging place for all sorts of deleterious substances present in the air. It is rubbed by soiled fingers, washed with impure water from rivers, creeks and ponds, wiped with soiled towels, handkerchiefs, coat-sleeves, and whatever else comes to hand. Moreover, the slight alkalinity and small amount of proteid material contained in the normal secretions as well as the fact that there are folds and crypts in the conjunctival membrane, favor the development of whatever germs accidentally enter. But aside from all these means of infection, an even more dangerous source of contamination is from the nose by way of the nasal duct and lachrymal sac, the continuity of the mucous membrane between these structures furnishing an excellent means of conveyance for saprophytic and parasitic (pathogenic) organisms from the eye to the nose, and vice versa. Again, infection of the conjunctiva may occur from disease of neighboring bones and inflammation of their sinuses, especially the maxillary sinus, or it may appear by the conveyance of micro-organisms to the conjunctiva through the blood-and-lymph vessels in cases of disease of remote organs.

Among the diseases in which the causative rôle is played by bacteria is Acute Catarrhal Conjunctivitis. Gifford in an examination of forty cases ascertained the cause to be the pneumococcus of Frænkel, he proved that the pneumococcus really caused the disease, by successful experiments in inoculating with pure cultures. Weeks, Moran and Beach also demonstrated this disease to be of microbic origin.

In acute Blennorrhoea of the Conjunctiva or Purulent Ophthalmia the etiological moment is the introduction into the conjunctival sac of some of the specific discharge from the urethra or vagina containing the gonococcus of Neisser.

Another disease which, as we all know, is of bacterial origin, but which fortunately is rare, is Diphtheritic Conjunctivitis. In the same category as Diphtheritic Conjunctivitis comes Tuberculosis of the conjunctiva caused by the bacillis of Koch.

Bacteriological research in connection with Xerophthalmos has resulted in the discovery of a bacillus which is believed by many investigators to be the cause of the disease, in the experiments 'conducted by Kuschbert and Neisser with this bacillus a moderate inflammatory reaction was obtained.

The bacteriology of Trachoma is of especial interest, and the investigations of Sattler, Koch, Michel, Washejewski, and many others, points to its being a germ disease, and to the fact that there is a pretty well established connection between trachoma and gonorrhœa, so it is not improbable that the rôle played by the gonococcus is of more importance in the etiology of trachoma than is generally supposed. Careful observation and study will go to prove that many corneal diseases are dependent upon invading bacteria. Leber has shown how serious may be the results of the growth of comparatively harmless organisms if once they secure a footing in the proper soil, and reason exists why we should believe that keratitis may result from ordinarily harmless bacteria should they gain an entrance to the corneal layers. Babes obtained from the broken down corneal tissues, and from various organs of a child who died of septicæmia, following keratomalacia, a bacillus which he termed the bacillus Septicus Keratomalacia, cultures of this bacillus inoculated into the cornea caused purulent keratitis. The capsule bacillus of Loeb was also obtained from a case of keratomalacia infantum, by inoculating media with a little of the softened exudate of the cornea.

Experiments with the bacillus of Fick which has been found in the conjunctival sac showed that when inoculated into the corneal tissues, the organism produced a distinct keratitis, and sometimes caused a perforating ulcer, which required about four weeks to penetrate the corneal tissues.

Investigations made in recent years have placed it beyond doubt that sympathetic opthalmitis is an inflammation propagated to the sympathizing eye by direct continuity through the optic nerves and chiasm from the exciting eye, as erysipelas extends over the skin, and that the Staphylococcus pyogenes albus, or aureus, is the active element in the process. Therefore in view of the fact that besides the bacteria occurring in connection with the diseases mentioned, and which we have no right to deny is the direct cause of them, we have to deal with such bacteria as the Bacillus Colicommunis, Bacillus Influenzæ, Bacillus Leproe, Bacillus Pyocaneus, Bacillus Syphilis, Staphylococcus Pyogenes Citreus and Streptococcus Pyogenes, most of which have been demonstrated as occurring in the conjunctival sac, and we have no reason to believe that the others do not, we are perfectly justified in believing that bacteria is one of the chief etiological factors in the diseases of the eye.

R. L. Randolph, of Baltimore, Md., "*Conclusions from Some Clinical and Bacteriological Experiments with Holocain.*"

His conclusions as to the value of holocain as a local anesthetic are practically in accord with the opinions of Würdemann, Derby, Black and others. The interesting and important feature in the author's work are the results of his bacteriological experiments. It will be remembered that Heinz showed that holocain retarded the growth of yeast bacteria, and while his experiments are suggestive they throw no light upon our knowledge of the effect of holocain on the pathogenic bacteria. Randolph's experiments were made with the micrococcus epidermidis albus (Welch) which he has found so often in the normal conjunctiva, with the staphylococcus pyogenes albus and aureus. He concludes as follows: "A 1 per cent. solution of holocain has not only an inhibitory effect upon the pus organisms, but these organisms are killed when exposed to a solution of this strength for a certain length of time. No attempt was made to determine the point of time at which these organisms lose their vitality on exposure to holocain, but it may be safely said that this point is somewhere within twenty-four hours. Furthermore, exposure to a 1 per cent. solution of holocain for periods of five, ten, fifteen, twenty, twenty-five and thirty-five minutes showed in every instance a gradually diminishing number of colonies in the plates, so that it is plain, in spite of the luxuriant growth around the glass rods and pieces of wood in the first, second and third series of experiments many of the organisms were killed. It may be said in conclusion, then, that a solution of the strength employed in ophthalmic practice possesses distinct germicidal properties, a fact which it is evident enhances the value of this product.

H. V. Würdemann, of Milwaukee, Wis., stated that solutions of holocain are stabile and antiseptic. A solution which had been kept for eight months and had been opened from time to time for the purpose of seeing whether it would remain stabile, is now clear and is as antiseptic and as anesthetic as when made. The extensive experiments made by Randolph have proved the claims of Tauber, Heinz and others and his own clinical investigations. He has had a fairly large clinical experience, having used solutions of holocain as a local anesthetic in almost all of the bulbar operations done during the last eight months. There have been made about twenty cataract operations, a number of iridectomies, eleven tenotomies, three advancements and a large number of minor operations by this anesthetic. Cocain has been used in other operations for purposes of comparison. Holocain has several distinct advantages over cocain.

Its action is quicker and more lasting.

It more thoroughly anesthetizes the iris and deeper structures.

It more thoroughly anesthetizes inflamed surfaces.

The anesthesia may be indefinitely prolonged.

The cornea does not desiccate under its use.

It does not affect the tension.

It does not act on the pupil or accommodation.

It does not interfere with the nutrition of the tissues, but rather increases their blood supply and hastens healing.

Its solutions are antiseptic.

It is proportionately cheaper.

There are also several disadvantages. It is more poisonous than cocain. He has not used it hypodermically, but has never had any ill effect from dropping in the eye. There is more bleeding than under cocain. Therefore it is really a disadvantage in some forms of muscle operations and where we have to go through the conjunctiva. It is slightly more irritating, and he has had patients complain on this account.

E. C. Ellett, of Memphis, Tenn., has used holocain in seven or eight cataract extraction, all of which were made with irridectomy, in one of which subsequent irridectomy was made the second day, and for removing foreign bodies from the cornea and conjunctiva. The anesthesia seems more satisfactory than cocain and the irritation is not as great. The fact that the pupil and accommodation are not affected is a decided advantage, especially in extraction of foreign bodies. Frequently workingmen desire foreign bodies removed from the eye without cocain on account of the dilatation of the pupil and effect on accommodation. It is a great satisfaction to have a local anesthetic that does not affect the vision. Another class of cases where holocain is particularly advantageous are the small but exceedingly painful corneal abrasions produced by scratches from the finger nail. These are extremely painful and, as holocain does not only relieve the pain by affording anesthesia but has a positive germicidal action, we need not hesitate to put it in the patient's hands for liberal use. He noticed that solutions standing a certain length of time in a glass bottle acquire a delicate pink color which may be due to some reaction between the drug and the glass. He prefers holocain for cataract extractions because it is a satisfactory anesthetic and is antiseptic.

Cassius Wescott, of Chicago, Ill., had used holocain for six months. In testing the rapidity of the anesthetic action of a 2 per cent. holocain solution he put in three drops within two minutes and immediately made section for cataract extractions without any sensation to the patient. He then put another drop in the anterior chamber and did the irridectomy within a few minutes without the slightest evidence of pain. On one occasion he used the 1 per cent. holocain solution for cataract extraction. The eye was exposed to the air thirty minutes and, although kept moist with boric solution, when he came to take out the speculum, he noticed that there was a bleb formed in the corneal epithelium. On operating on the other eye two or three weeks afterwards with 4 per cent. cocain solution this did not occur. The eye being exposed to the air this time but fifteen minutes. He therefore thinks that holocain is not absolutely without evil effect to the cornea.

F. C. Hotz, of Chicago, Ill.—Holocain in solution is and remains sterile for an indefinite length of time. It is a most valuable local anesthetic. It is the ideal local anesthetic for removing foreign bodies. To have a remedy at hand which we know will not carry any infectious germs is of great value. He has noticed that it causes congestion of the eye and in muscle operations there is more hemorrhage than under cocain. To obviate this disturbing element he first uses cocain to produce anesthesia and then keeps up the anesthesia by holocain, for holocain will keep up continual anesthesia for any length of time if the instillation is repeated about every five minutes. From such continued use he has had no disturbing elements.

[*To be concluded in August number.*]

CORRESPONDENCE.

Editor of the Ophthalmic Record:—In your June issue there appears a note from Dr. Edward P. Brewer, of Norwich, Conn., calling attention to the "Preliminary Statement" of Dr. Wm. E. Baxter, of Boston, in which he claims priority of use of the Maddox rods in testing the obliques. I am glad to see both of these gentlemen coming forward and devising and improving instruments and methods of testing the obliques, but then they must both allow me to call their attention to methods used by myself some two years previous to these mentioned in their papers or communications. In 1893, toward the close of the year, or early in 1894, I had made by Messrs. F. A. Hardy & Co., of Chicago, a little device which I used for testing these very conditions, and which I still have and keep in my case for this very purpose.

Now, while I am not desirous of detracting from the well-earned reputation of these gentlemen, yet I am ready to claim priority for myself in this field, and think my claim to this can be very fully substantiated when I call the attention of the gentlemen to a paper presented by myself at the San Francisco meeting of the American Medical Association, June 5-8, 1894. The paper, "Cyclophoria, its Detection and Treatment," was read by me in person, and a description of the instrument used was given, as can be seen on page 135 of the published transactions of 1894. I herewith quote a few lines from that published report:

"The testing apparatus is a combination of the double prism and the Maddox rod in front of one eye and the rod in front of the other, and is used in conjunction with the candle or gas-jet at twenty feet. The double prism converts the single line of light, made by the rod, into two lines, which lines are parallel and about eighteen inches apart, while the rod alone in front of the other eye produces a single line of light, which should be half way between the upper and lower line (provided there is no hyperphoria or cataphoria) and parallel to them.

"If cyclophoria is present there is a deviation or dip which will be of the same character as that shown by card test at eighteen inches. The little device I present for your inspection."

Again, you will find this same language in THE OPHTHALMIC RECORD, November, 1894—page 188. From this, Mr. Editor, you can see that the gentlemen who have been using this method, and such other modifications as are now being presented for our consideration, are from two to three years behind the real first use of the Maddox rod in this particular field of investigation. In view of these facts which I have set forth, I feel satisfied that Dr. Brewer will grant that I was in the field a little before any of the gentlemen using this method with its various modifications.

Yours very truly,

GEO. H. PRICE.

710 Church St., Nashville, Tenn.

NOTE ON EXTREME ROTATION OF THE EYEBALLS INWARDS.

BY MR. E. DONALDSON.,
LONDONDERRY, IRELAND.

In the May number of THE OPHTHALMIC RECORD, a case of Bilateral Abducens Paralysis is recorded by Dr. Fisher. In the *Transactions of the Ophthalmological Society, of the United Kingdom*, Vol. XI., p. 115, I have recorded a similar case. These are the only two recorded cases of this affection that I know of. Their pathology is of course very obscure. It has occurred to me that in these cases some process like that which produces Dupuytren's Contraction of the fingers may be at work. But before any solution of their pathology can be arrived at, it will be necessary to have a considerable number of cases recorded, and especially to observe the early stages. There are two elements in the affection, the paralysis of the External Recti and the contraction of the tissues on the inner sides of the eyeballs; and it is difficult to assign to each element its proper importance. It seems to me possible that the process of contraction may be the more important element of the two, and may even be the cause of the affection. This can only be determined by watching the disease in an early stage.

In the case recorded by myself the last time I saw the patient I wanted to draw the cornea out as far as possible under cocaine, but I found the patient in a dying condition, and I did not disturb her.

NEWS ITEMS.

Personals and items of interest should be sent to
Dr. Frank Allport, 92 State St., Chicago.

THE THIRD VOLUME of Norris & Oliver's "System of Diseases of the Eye" was distributed in June.

DR. F. B. EATON has removed from San José, Cal., to 704 Sutter street, San Francisco. The good wishes of THE RECORD go with him.

DR. EDWARD S. PECK has been appointed Professor of Diseases of the Eye at the New York Post-Graduate Medical School and Hospital.

DR. H. B. YOUNG, of Burlington, Iowa, has been elected President of the Iowa State Medical Society. The ophthalmologists are slowly but surely coming to the front.

THE MARYLAND OPHTHALMOLOGICAL AND OTOLOGICAL SOCIETY was organized March 29th in Baltimore by the principal eye and ear surgeons of the State. Dr. Russell Murdoch was elected President and Dr. H. O. Reik, Secretary. The Society meets the second Thursday of each month.

THE ANNUAL MEETING of the American Ophthalmological Society will take place at New London on the 20th and 21st of July. THE RECORD will furnish a full report of the proceedings of the Society in its September issue.

THE FOLLOWING PAPERS on ophthalmic subjects were read at the annual meeting of the American Academy of Medicine: "The Care of the Eyes During School Life," by Dr. Edward Jackson, of Philadelphia, and "Kindergarten and Primary Grade Work in the Public Schools, and its Influence Upon the Eyesight," by Dr. Casey Wood, of Chicago.

PRESIDENT SCHURMAN, of Cornell University, has finally announced the names of the new medical faculty, whose school will be located in

New York City. Among the gentlemen were noticed Charles Stedman Bull, Professor of Ophthalmology, and Gorham Bacon, Professor of Otology. No better selection could have been made, and their appointment insures the thorough teaching of these branches in the new school.

Dr. T. A. Woodruff, editorial secretary of the Ophthalmic Record, who was to have accompanied one of the Chicago parties to the American Medical Association, was suddenly called to Canada by the serious illness of his father. At last advices Doctor Woodruff's father was still in a critical condition, although somewhat improved. Doctor Woodruff's friends all hope that his father may soon make a fortunate recovery.

It is our painful duty to record the death of Dr. Robert Tilley, of Chicago, who was found dead in his bed at the Lexington Hotel early in June. Doctor Tilley was an Englishman by birth, but has lived in this country many years. He graduated at the Chicago Medical College in 1876, and was one of the best students in his class. He was ophthalmologist to St. Luke's Hospital in Chicago, and was a hard working and conscientious man. Many friends and patients deeply regret his untimely and sudden death.

Prof. Dr. von Michel, of Würzburg, celebrated, May 1st, the twenty-fifth anniversary of his professorship in ophthalmology. After several years' service as assistant physician to Professor Horner in Zurich, Michel in 1872 became privatdocent in Leipzic, and was shortly afterwards called to Erlangen and appointed professor. He began his lectures there in the summer semester of 1873. In 1879 he followed up his work in Würzburg, and has continued his teaching there ever since. His scientific attainments are so well known that it may be said that no oculist in all the world has not profited by them. The former and present assistants of Michel have honored him with a testimonial, which was given in the Stuttgart Industrial-Science School under the direction of Director Kolb.

The Royal London Ophthalmic Hospital.—The Duke of Cambridge, who presided at the festival dinner of the Royal London Ophthalmic Hospital on May 6th, said that it was hoped that the new buildings would be ready for occupation within the year. They would provide accommodation for 140 in-patients, which was 40 in excess of the number which could be accommodated in the present building in Moorfields. Sir John Lubbock, who responded to the toast of "Prosperity to the Hospital," said that it was the oldest ophthalmic hospital in the world, having been established in 1804, and he might have added that there is none which has had more distinguished ophthalmic surgeons on its staff, or has been instrumental in contributing more to the advance of ophthalmic medicine and surgery, and thus benefiting suffering humanity throughout the world. The total expenditure of the hospital is £6,379, which leaves a deficit of over £1,000. Donations and subscriptions were announced amounting to £1,435.—*British Medical Journal.*

Slander of a Physician.—The court of appeals of this State has recently handed down a decision of general interest, as showing that a medical man has some rights which an offended patient is bound to respect. A physician who was called in to attend a neighbor's daughter, prescribed belladonna for her. Within a few days she began to lose her eyesight and became almost totally blind. When this loss of vision was first discovered, the attending physician and another who was called in consultation attributed it to the action of the belladonna, but later they came to the conclusion that it was not due to this cause. The doctor was obliged to sue for the payment of his bill, the defense being that the blindness was caused by the belladonna administered. The jury disagreed, but the man later paid the bill, or a portion of it. Afterwards he published an article, asserting that the physician, through carelessness and ignorance in prescribing the belladonna, was directly responsible for the patient's loss of vision. The doctor then brought an action against the writer of the article for slander and libel. The expert witnesses all testified that belladonna could not have caused the blindness, but the court nevertheless acquitted the defendant. This decision has now been reversed by the court of appeals, the judge holding that the justification sought to be established by the defendant had failed, and that the verdict was against the weight of evidence.—*New York Medical Record.*

The Meeting of the American Medical Association in Denver was an unqualified success, and the meeting of the Ophthalmological Section was up to its usual standard, although the familiar faces of Knapp, Risley, De Schweinitz and others were much missed. The humorists of the Section, Doctors Thompson of Indianapolis and Savage of Nashville, were there, and added their usual welcome flavoring to the proceedings of the Section. Doctors Black, Rivers and others, of Denver, did much to make the meeting successful in adding to the comfort of their fellow ophthalmologists and earned their deepest gratitude.

The next meeting of the Association will be held at Columbus, Ohio, which, while it is certainly too small a city for such a large gathering, is well situated geographically and should bring out a large number of interesting men. The RECORD begs leave to suggest to the gentlemen who have the matter in charge that it will probably be more satisfactory to the greatest number of people if the ophthalmological and otological meeting rooms were close together. These two places of meeting were unfortunately located in Denver and proved a source of much inconvenience to many. Many ophthalmologists are also otologists, and like to vibrate between the two sections in accordance with the special interest of certain papers, and if the rooms are adjacent to each other this can be easily accomplished.

Among the wives of ophthalmologists present were noticed Mesdames Starkey, Holmes, Fulton, Würdemann, Connor, Hotz and Montgomery.

DR. EDWARD JACKSON informed the RECORD that he had finally and permanently moved to Denver on account of the health of his children. The Doctor was busily engaged in looking up a house and office during the meeting of the Association, but still found time to attend the Section meetings and allow his voice to be heard in the general session of the Association. This is a sad blow to Dr. Jackson's many friends in Philadelphia, for, as is well known, he is much beloved and highly respected in his native city; but what is Philadelphia's loss is Denver's gain, and it is to be hoped that the Doctor will soon be as busy in Denver as he always has been in Philadelphia. Dr. Jackson intends returning to Philadelphia once a year and delivering a course of lectures at one of the institutions of that city. He has resigned from the staff at Wills Eye Hospital, and Doctor Schwenk has been appointed by the Board of City Trusts to fill his place. Doctor Schwenk is well liked by his professional brethren and is a member of many medical societies of the State.

MANY REGRETS were expressed at the excellent and elaborate paper of Dr. C. R. Holmes, of Cincinnati, on "Lacrymal Diseases," not being read in full owing to the time limit adopted by the section. While ten minutes is long enough, and we may even say too long, for some papers, it is much too short for others. Very few able, exhaustive and dignified papers can be read in ten minutes, and it is questionable whether in the long run it would not be better to allow essayists fifteen minutes for their papers. Many superior papers are simply mutilated beyond all recognition in the hurried efforts to read them in ten minutes, and it would be better to have fewer papers of superior quality read and well discussed, than more papers of questionable utility hurriedly read and poorly discussed. Doctor Holmes' fresh specimens of the lacrymal passages are amongst the very best pathological specimens ever exhibited in the Section.

The Section officers for the coming year are, Chairman, Dr. Casey Wood, of Chicago; Dr. C. H. Williams, of Boston, Secretary.

The Section dinner at the Brown Palace Hotel, Tuesday evening, June 7th, passed off with the same cordiality and good feeling that always accompanies these dinners. Doctor Gifford presided as toastmaster with much grace and tact, and the different toasts were responded to by Doctors Reynolds, Connor, Wescott, Rivers and Wood. A telegram was sent from the dinner to "everybody's friend," Dr. E. L. Holmes, of Chicago, expressing the regards of the Section, and regretting that he found himself unable to attend the meeting. There are few names that create such enthusiasm at meetings of the American Medical Association as those of Dr. N. S. Davis and Dr. E. L. Holmes, of Chicago.

THE EDITORS and collaborators of the OPHTHALMIC RECORD had a pleasant dinner at the Denver Club, being entertained by Dr. Casey A. Wood, of Chicago. Those present at the dinner were Doctors Wood, Savage, Würdemann, Gifford, Allport, Randolph, Black and Fulton. The dinner was held for the purpose of consulting concerning the policy of the OPHTHALMIC RECORD management, looking over its finances, etc., and it is believed that the free expression of opinion indulged in at the dinner will make the OPHTHALMIC RECORD even more satisfactory to its subscribers in the future than it has been in the past.

It is hoped that every ophthalmologist in the world will subscribe for the OPHTHALMIC RECORD, and thus enable its managers to make it the very best contribution to ophthalmological literature in existence. Subscribe for the OPHTHALMIC RECORD and make your ophthalmological friends do the same.

At the last meeting of the Clinical Society, Louisville, Ky., the resignation of Dr. T. C. Evans, as a member, and as the society's president, was read and accepted, and Dr. Philip F. Barbour was elected to the presidency.

OPHTHALMOLOGICAL SOCIETY.—This society being the eighth medical society now in existence in Louisville, was recently organized with thirteen members. Dr. T. C. Evans is President.—*Journal American Medical Association.*

THE

OPHTHALMIC RECORD

A MONTHLY REVIEW OF THE PROGRESS OF OPHTHALMOLOGY.

VOLUME VII. CHICAGO, AUGUST, 1898. No. 8. NEW SERIES

ORIGINAL ARTICLES.

A MODIFICATION OF THE ANTERIOR CHAMBER SYRINGE.

BY J. A. LIPPINCOTT, M.D.
PITTSBURGH, PA.

Illustrated.

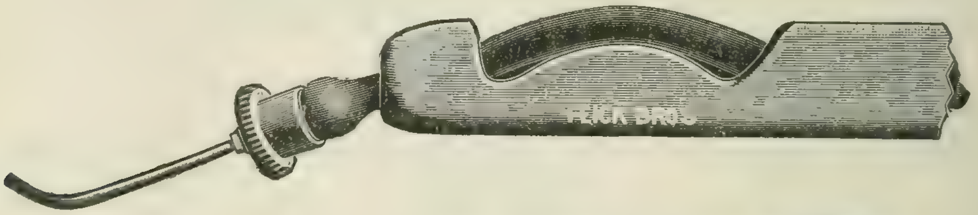
My object in modifying the syringe with which my name is associated was partly to simplify its construction but chiefly to give it such a form that it might be boiled without detriment, and its sterility be thus secured beyond the peradventure of a doubt.

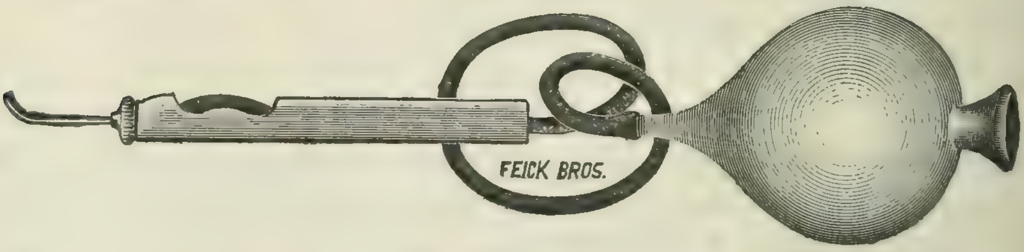
The changes made are in the handle, which is of German silver, nickelplated, instead of hard rubber. The current is controlled by pressure with the index finger directly on the rubber tube, which is exposed for the purpose, such pressure being facilitated by an elevation in the floor of the canal through the handle. The original instrument was introduced at the 1889 meeting of the American Ophthalmological Association, and the claim was then made that cortical remains could by its aid be removed *cito tuto et jucunde.* This claim has been sustained by a personal experience of over three hundred extractions, and many of my colleagues have testified to the utility of the apparatus.

While the main purpose of the syringe is to remove cortical débris, it also affords the best means of clearing the anterior chamber of blood, or of air bubbles which may have been accidentally introduced. At the same time it enables the operator gently but effectually to replace a protruding bit of iris or tag of capsule, and to remove every obstacle to perfect apposition of the lips of the incision. How necessary such apposition is to smooth healing requires no demonstration. I do not irrigate the anterior chamber in cases in which the posterior capsule is broken during the operation, as shown by the presenting or escape of vitreous.

It may be permissible to repeat what has previously been said: that the reservoir should be held not higher than ten inches above the eye operated upon, and that the fluid employed should not be irritating. I have had satisfactory results from the use of a sterile solution of boric acid, gr. 2 to the oz., at a temperature of 98° to 100° F.

To sterilize the syringe I boil it along with other non-edged instruments for about ten minutes before each operation in a borax solution about 10 gr. to the oz., having previously filled it with some of the same solution. The boric acid irrigating fluid should be allowed to run for a few moments through the instrument, as strong borax solutions are rather irritating to the interior of the eye.





In boiling the syringe the same care should be taken as is necessary for all instruments. In the first place, the holder if made as ordinarily of copper, nickelplated, should not have been put together with soft solder, because solder flows when boiled, and its nickel covering is displaced. The boiling alkaline solution then attacks the solder, producing a blackish deposit which attaches itself the instruments. In the second place nickelplated and steel instruments should not be boiled with instruments having German silver handles, since the copper in the latter is acted upon by boiling alakaline solutions, producing a greenish-yellow salt of copper, which may adhere to all the instruments in the boiler. For a similar reason aluminium handles should also be excluded.

The syringe is made by Feick Brothers, of Pittsburgh.

THE LAWS OF VISIBLE DIRECTION — AN OPEN LETTER TO DR. G. C. SAVAGE.

BY DR. HAROLD WILSON.
DETROIT, MICH.

Illustrated.

My Dear Doctor:—In your kind letter of the 10th inst. you have asked for my present opinions respecting your theories of oblique astigmatism, which I at one time criticised, and also for an opinion upon your theory of the "Law of Direction."

In respect of the "Law of Direction," I have read your paper* on this subject with much pleasure. If you will pardon my appearing again in the rôle of a critic, I beg to offer the following:

1. That law of direction which you have quoted and ascribed to Helmholtz, viz., "Every line of direction is an axial ray of a cone of light, these all crossing at the nodal point of the eye," does not really represent the teachings of Helmholtz in this matter, but rather those of Volkman and his followers:†

2. That law which you set forth as original with yourself, viz., "Every line of direction is a radius of retinal curvature prolonged," was enunciated by Porterfield‡ about 150 years ago, and after him by d'Alembert, Bartels, Brewster and many others.

A careful examination of the known facts bearing upon the laws of visible direction will convince anyone, I think, that the matter is not quite so simple as either of the above theories would seem to make it.

Our judgments as to the location of objects in space are the results of several coöperating factors:

1. The present visual sensations.
2. The present and associated ocular muscular sensations.
3. The present and associated bodily sensations.
4. Associated visual and bodily sensations, muscular and tactile, immediately absent at the time, but present in the imagination.

(*) G. C. Savage, Three Facts and Two Theories as to the Laws of Direction: OPHTHALMIC RECORD, January, 1898.

(†) Volkman, *Beitraege zur Physiol, des Gesichtsinnes*, Leipzig, 1836. See Helmholtz, *Physiol. Optik*. 2d Ed. 1895. Part X., p. 765.

(‡) Porterfield, *A Treatise on the Eye*, Edinburgh, 1759, II, p. 285.

5. To these may be added such innate ideas concerning space as our philosophical opinions may permit us to believe in.

Visual judgments, however derived, are by no means uniformly correct. In fact, certain of them are on the contrary, uniformly incorrect. A distinction must be made between the apparent and the geometrical positions of objects in the visual field. For all points lying in the visual axis of the eye the geometrical and apparent directions coincide. This is almost a practical necessity, and is exemplified in most bodily movements based upon sight. For points at finite distances from the eye, outside of this axis, that is, for those seen indirectly, these directions do not coincide. In other words, there is normally a parallax between the apparent positions of an object at a finite distance, seen in direct and in indirect vision. I shall examine this parallax a little further on.

We speak of the "direction" of objects. This implies two things: a point of fixation or departure, and a straight line from this point to the object in question. Mathematically, we may fix the position of such a line in space by its relations to certain other fixed lines or planes. All objects or points in the same direction, from such a point of fixation lie in the same right line of direction. Thus is Fig. 1:

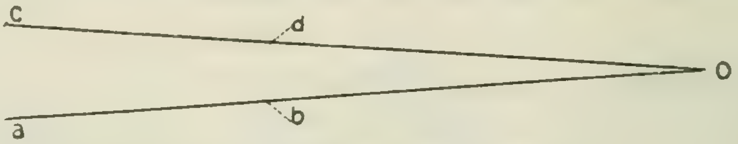


Fig. 1.

Let *oa* represent the visual axis, the eye being accommodated for the point *a; b* is a point of the visual field lying in the direction *oba*, *c* and *d* are similarly points lying in the direction *odc; oba* and *odc* are right lines intersecting the point *o*. Any two points, *x* and *y*, appearing to the eye to lie in the same direction must therefore lie in a right line passing through *x* and *y* and intersecting all other lines of direction in the point *o*.

Two conditions of vision must be distinguished, in which the image of a luminous point may appear upon the retina, 1, as a point; 2, as a diffusion circle. It must also be noted, what so often is forgotten, that the ordinary dioptric formulæ for the eye, apply only to the refraction of rays entering very close to the optic axis. They are not simultaneously true for the entire corneal surface, nor for both direct and oblique pencils of light. Moreover the retinal image is never uniformly distinct. Helmholtz says:* "The optical image upon the retina possesses absolute sharpness only in the vicinity of the optic axis. Consequently, as a rule, we see clearly only a single point of the visual field, which we fixate, everything else being indistinct. This indistinctness in indirect vision is also dependent upon a lessened sensitiveness of the retina, which at a short distance from the fixated point is more important than the objective indistinctness of the retinal image. The eye is an optical instrument with a large field, but in only a small, very restricted portion of this field are the images seemingly distinct. The whole field resembles a drawing in which, although the most important portion is minutely elaborated, the surrounding portions are only sketched, and the more crudely sketched the farther they are from the principal portions."

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* Helmholtz: *Physiol. Opt.* 2d Ed. Part II., p. 87. 1886.

If from the image upon the retina of a luminous point for which the eye is accommodated (focussed), a right line is drawn to the posterior nodal point of the eye, then the right line connecting the anterior nodal point and the luminous point is parallel to this line. Or, if the anterior nodal point is disregarded, as may be done with but little error, then a right line connecting the luminous point and its image passes through the posterior nodal point. Such a line is called a *line of direction.* All lines of direction intersect at the nodal point.

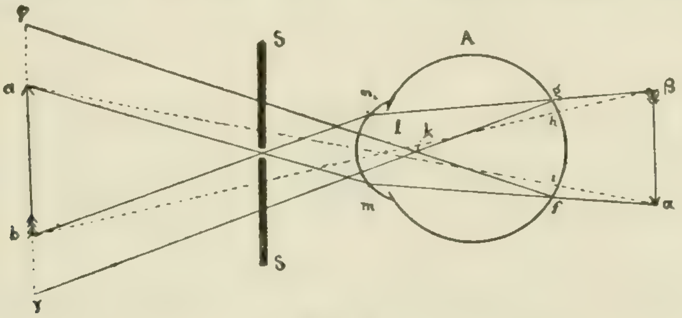

Fig. 2.

When the image upon the retina, of a luminous point, is a diffusion circle, then the axis ray from the luminous point to the center of the corneal image of the pupil is refracted to the center of the real pupil, and from there as if it came from the center of the lenticular image of the real pupil. The line from any luminous point to the center of the corneal image of the pupil may be called a *line of alignment* (*visirlinie*). These lines, therefore, intersect at a common point, the center of the corneal image of the pupil, lying in the anterior chamber and distant from the center of the real pupil 0.564 mm. and 0.539 mm. in distant and near vision respectively. Any two points of the visual field, the center of whose diffusion images upon the retina coincide, lie along the same line of alignment, that is, in the same apparent direction from the eye.

The distinction between lines of direction and lines of alignment may be illustrated by figure 2 (from Helmholtz) :

A is the observing eye ; *a* and *b*, luminous points of the object ; S. S., an opaque screen with a small central opening. Owing to the interposition of the screen, the only rays reaching the eye from *a* and *b* respectively are am_1 and am_2. These form the image $\alpha\beta$ of *ab*, and intersect the retina at *f* and *g*. Now the diaphragm has so reduced the diffusion circles upon the retina, of the rays from *a* and *b*, that their images are seen with reasonable clearness. If, then, we draw *gk* and *fk* through the nodal point *k*, and prolong the lines until they intersect the plane of *ab* in γ and φ respectively, $gk\gamma$ and $fk\varphi$ are the lines of direction of the points *g* and *f*, the point *a* of the object being seen at φ and the point *b* at γ. That is, the eye sees *ab* enlarged to $\varphi\gamma$.

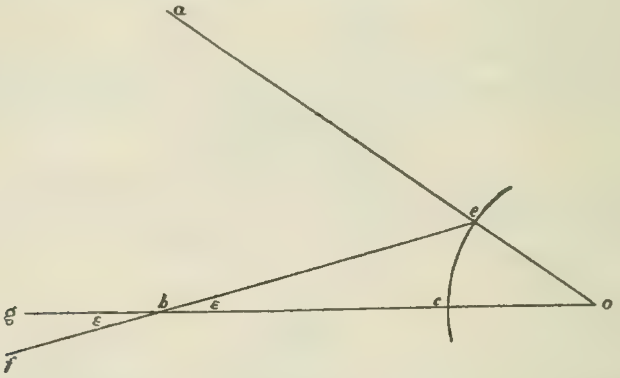

Fig. 3.

If the screen is removed, the retinal image of *ab* consists of diffusion circles. If *l* is the point of intersection of the lines of alignment (middle point of corneal image of pupil), *al*, the line of alignment of *a*, produced, meets the retina in *i*, and *bl*, the line of alignment of *b*, meets the retina in *h*. The retinal images *i* and *h* are therefore localized at *a* and *b*, the retinal diffusion image of *a* and *b* being *i* and *h*, lying closer together than *f* and *g*. The object *ab* then appears smaller and less distinct than when viewed through the screen.

The parallax between the apparent position of objects seen in direct and in indirect vision may be illustrated by figure 3. (From Helmholtz.)

Let *o* be the center of rotation of the eyeball, *b* a luminous point in the field of vision, $oc = oe$ the distance from *o* of the point of intersection of the lines of alignment. When the eye fixates the point *b* directly, it is seen in the direction *og*. Let the eye rotate until the visual axis lies in the line *oa;* that is, until the line *oa* is the line of direct vision. Then the point of intersection of the lines of alignment will be at *e*, and from what has been shown above, the point b will appear in the direction ef, forming the angle $ebo = \varepsilon$ with og. This angle is the parallax of the point b in direct and in indirect vision.

It is obvious from the figure, that for objects at an infinite distance from the eye, this parallax is infinitesimal, ef being then parallel to og.

That this parallax is not an imaginary mathematical creation is easily demonstrated by experiment.

Fixate some distant luminous point. Hold an opaque screen six or eight inches from the eye, so placed that its right-hand edge just obscures the luminous point. Now, the screen remaining unmoved, rotating the eye to the right brings the light at once into view. In a similar way, if the screen is held so as to obscure the light with its left-hand edge, rotation of the eye to the left brings the light into view.

In taking the field of vision with the perimeter, its periphery, as recorded by that instrument, is the geometrical, and not the apparent field.

The foregoing are some of the more important factors of the simple visual sensations involved in the localization of objects in the monocular visual field. It must be clearly borne in mind, however, that the retinal image is not the sensation, but, at most, is only its "local sign." We have no consciousness of the mutual relations of retinal sensations as such. Visual sensations are, in consciousness, never referred to the retina itself, but are projected outward into space. It is conceivable, in fact it is demonstrable, that another and different order of retinal images than that which commonly exists might obtain, and yet our visual and spatial notions be in nowise altered.

Simple retinal impressions are often ambiguous or positively misleading, as witness numerous and well known optical illusions, such as "Zoellner's Pattern" or "Schroeder's Steps."

The second factor in the genesis of our judgments as to the direction of objects in space, is the present and associated ocular muscular sensations.

If two luminous points in space are perceived simultaneously, and if the eye fixates first one of them and then the other, the muscular effort (and skin sensations) involved in rotating the eye, so as to bring each point in turn in the line of direct vision, gives us certain information as to the relative directions in which these points are to be found. If an ocular muscle be paralyzed so that the rotation of the eyeball in the direction of this muscle is difficult or impossible, the normal relations between the muscular and visual sensations is ruptured, and judgments as to the position of objects lying on the side of the paralyzed muscle become erroneous.

Somewhat the same things may be said of the present and associated bodily sensations. One way, at least, in which our notions of space have been developed, is by the association of sight and touch. Objects seen by the eye have been grasped by the hand or touched by some other portion of the body, and the relations between the seen and the felt positions of objects in space have come to be very intimate and fundamental. In fact, the direction and position of objects in space is practical and important only with reference to some possible bodily movement in relation to these objects. We wish to touch or to avoid, to go or to look toward or away from external objects which we have localized either in direction or position, or in both.

Finally, our judgments of direction are dependent upon something beside the present sensations. The relation of two objects in the visual field, simultaneously perceived, is conditioned not only by the present visual sensations, but by those absent but remembered or imagined sensations relating to these objects. Two objects lie, for example, in the same meridian of the visual field. The imagined rotation of the eyeballs or bodily movements required to fixate or to touch these objects successively, is an important element in our cognition of their relative positions.

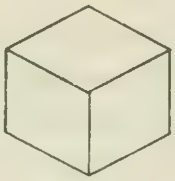

Fig. 4.

The resulting impression upon the mind arising from any given retinal sensation, is often, or perhaps usually, a compound of both present and past sensations. A cube may be seen as no less a cube, even when held as in Fig. 4, so that in its retinal image no one of its angles is a right angle, nor any of its visible faces a square. We more commonly see things as they are, than as they look. In truth, it requires special training, as in artists, to inhibit this selective and reproductive activity of the mind.

In the study, therefore, of the question of the laws of visible direction, we must not confuse the retinal image with the subjective mental state, sensation or perception which accompanies it, nor demand a rigid conformity of the two things. Any argument as to these laws based exclusively upon the properties of the dioptric image will necessarily be imperfect. It is not simply a geometrical, but a physiological and psychological problem.

If we were to examine in detail, my dear doctor, the argument in your paper above referred to, the following brief remarks will indicate what seem to be its essential defects:

1. The theory you advance is not at all new, but on the contrary, as already pointed out, is among the oldest of several that have been put forth. It has long ago failed to stand the test of time.

2. The diagram used by you to illustrate the retinal radius theory is very imperfect; the rays as drawn from the indirect luminous points 1 and 2, do not show the actual paths of these rays. The ray 1c as drawn, would not enter the pupil or reach the retina at all. That the temporal limit of the visual field is 90° or more, is a matter of what is called "aperture" of the eye, as an optical instrument, and does not necessarily prove the proposed theory or have any connection with it.

3. Diagram 3 and the statements in connection with it, are open to the same fatal objections of being inaccurate and untrue.

4. Reasoning from the photographic image is invalid for reasons I have given above.

I have not touched upon the binocular visual field, nor upon many important factors cognate to the general problems of visible direction and space perception. A complete discussion of these subjects would involve a much more extended treatment than the present one. Enough has been said, however, to show that the matter is not quite so simple as you would have us believe, and that the retinal radius theory of Porterfield, even as revived and renewed by yourself, is altogether too imperfect a key to unlock the mystery.

The discussion of oblique astigmatism, I beg to leave for another and later communication.

32 West Adams Avenue, June 4, 1898.

EYE PROTECTOR.—The *Journal d'Hygiène* of March 10th describes an extension of the eye-glasses of bicyclers, etc., made of celluloid or some similar substance, which clamps over the eye-glass and extends to enclose and fit tight over the entire orbital region, preventing the entrance of dust or wind, although ventilated at the side.

RESTORATION OF THE FORNIX CONJUNCTIVÆ FOR RETENTION OF A PROTHESIS.*

BY HOWARD McI. MORTON, M.S., M.D.

Oculist and Aurist to the St. Barnabas and Northwestern Hospitals, Minneapolis.

We meet with cases in which the insertion of a prothesis is difficult, or impossible. The cause of this difficulty is usually found in a partial or complete obliteration of the fornix conjunctivæ, the lower one usually, sometimes, however, the upper, sometimes both. The origin of this condition may be traced to several factors. One of these is found in a careless and over-hasty enucleation, in which insufficient attention has been given to the preservation of as much of the bulbar conjunctiva as might, and should be, preserved. As a result, we observe traction upon, and partial or complete effacement of, the folds of the cul-de-sac, in the cicatricial processes following upon the healing of the wound. Another common factor in the causation of this condition is found in the long continued nonuse of a prothesis after enucleation. As a result of this nonsupport, the definition of the folds is lost. If some substitute for the globe were always inserted after enucleation—either a Mules operation or the operation (1) as suggested and practiced by the writer—the conditions which make difficult the insertion of an artifical eye would not be found to exist, even though no artificial eye had been worn for a length of time. Trauma may be observed as a factor in adhesive processes in the cul-de-sac, either before or after enucleation. In certain cases we observe that the obstruction lies in one or more isolated bands or columns of cicitrized tissue; in others, in a general obliteration of the upper or lower fornix, or both, in which case the prothesis, if inserted, slips out immediately.

In a class of extreme cases the lid margin is actually involuted to such a degree by the adhesive processes that it occupies the normal position of the original fornix. Such marked pictures find their origin either in severe trauma or in those cases of enucleation in which almost all, or quite all, of the bulbar conjunctiva is sacrified. Thus we see, as a result of the factors previously spoken of, together with others less important, a variety of clinical pictures all rendering the wearing of a prothesis either unsatisfactory or impossible, and in which operative interference is indicated. So far as I have ascertained, authors refer—if at all—to these cases as intractible, and omit definite directions for their correction.

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*Read by title before the Western Ophthalmologic Oto-Laryngological Society at Chicago, April 8th, 1898.

The mere cutting of the bands is unsatisfactory, the original condition being exaggerated by this procedure. The general principles involved in the operation I propose are not original, but the method of retaining the graft by a line of sutures and the immediate insertion of a prothesis, so far as I am aware of, are new, and mark a decided improvement over the previously inadequate method of the attempted retention of the skin graft by gauze packing. In fact, convert a procedure, usually attended by failure, into a successful method of dealing with an obstinate class of cases. My method of operating is as follows:

Inside of, and parallel to, the lid margin a deep incision is made from canthus to canthus and extended slightly upward above the level of the canthi. The object in view is to preserve this artificial fornix. After all bleeding has been controlled we proceed to insert and *to retain* a skin graft. It is imperative that the graft be retained in perfect opposition with the side and floor of the raw surfaces of this incision. The usual failure in this operation heretofore has been due to the inability to accomplish this result. The graft—involving the superficial elements of the skin only—is cut of sufficient size to admit of some subsequent shrinkage, without inducing traction upon the floor of the new fornix. These grafts are best removed and applied to the raw surfaces by following the technique laid down by Réverdin (2) and Thiersch. (3)

The graft may be best applied by using a blunt pair of forceps, or scissors, and a bulb-pointed probe. This part of the operation being finished, a line of small sutures (Chinese twisted silk No. 5 or less) are used to retain *the outer* lip of the wound to the graft. The capillary hemorrhage following the insertion of this line of sutures is sometimes annoying, but by rapid and careful mopping with small cotton applicators the blood may be prevented from detaching the graft from the raw surfaces.

A prothesis *as large as can be used* is now inserted, its lower edge occupying the new fornix completely, and accurately retaining the graft to the floor and to all parts of the wound. It is obvious that, in order to avoid traction upon the transplanted epidermis, and to obtain accurate adjustment of it at the same time, only one row of sutures—I prefer the outer—can be permitted. The insertion of this line of sutures, with the utilization of a prothesis, to retain and approximate the graft is the point I desire in this article to emphasize. After the insertion of the prothesis, a light dressing is applied and permitted to remain undisturbed for a period of five or six days. It may then be removed to douche and dress the orbit, but must be reinserted and retained without interruption from the day of operation until the orbit is fitted with a permanent shell.

I have had several complete successes and *one complete failure. The last was due to the insertion of too small a prothesis.* As a result of this the graft wrinkled, became irregularly adherent to the raw surfaces, and a failure followed. No reaction follows the operation.

Finally I desire to insist that the old and still common method of simple enucleation is unjustifiable and unsurgical. There are no cases in which either the operation proposed by Mules, or the one by the writer, are not applicable, and attended by much better cosmetic and mechanical results than follow simple enucleation.

References:
1st. *New York Medical Journal,* Oct. 30, 1898;
2d. *Tillmann's Principles of Surgery and Surgical Pathology*;
3d. *Tillman's Principles of Surgery and Surgical Pathology.*

Suite 315 New York Life Bldg.

A CASE OF RETINAL HEMORRHAGE.

BY H. BERT ELLIS, M.D.
LOS ANGELES, CAL.

On the 20th of December, 1897, there was referred to me a married woman,—the wife of a physician, twenty-five years of age, a woman of splendid physique. She gave the following history:

On the preceding morning, shortly after arising, she had a feeling as if both eyes were turning in, and she called the attention of her husband to the fact, but he was unable to see any indication whatever of strabismus, nor could he discover anything out of the way with the appearance of the eye. Some two hours later, she became quite blind in both eyes. During the day she had vertical headache, which grew easier towards evening, and she had a fairly good night's rest. She gave a history of occasional vertical headaches all her life. The headache on this occasion was not greater than those she usually had. On the day on which she presented herself to me there was no appearance of strabismus. The vision of the right eye was six-fiftieths and of the left six-fifteenths, but she stated that she could see much better with the left eye than she had been able to on the preceding day, but the field of vision in each eye was considerably reduced, being not more than half what it should be in the right and slightly more than half in the left. An ophthalmoscopic examination revealed a small retinal hemorrhage in the right eye below and external to the macula lutea. The examination of the fundus of the left eye was negative, the vessels, nerve and retina being perfectly normal. The only history that led to a supposed cause was that the night preceding the sudden blindness she had been to a theatre party, followed by a light champagne supper and dance. The theatre was not exciting, she drank but one glass of champagne, and as she was perfectly accustomed to both of these mild dissipations I hardly thought that they could be the cause, but she got very much heated dancing and this possibly may have been the exciting cause. Upon inquiring more closely into her history, I found that her father had been a dissipated man, and that both her sister and she had inherited a neurasthenic taint. She was certainly, so far as appearances were concerned, a robust, healthy looking woman, a good sleeper, a fair eater, with good digestion. She had no albuminuria, no valvular or other heart trouble. Her breathing was normal and regular. She gave no history of acquired syphilis. In other words, she had no organic disease that had been discovered or that I could find out.

She had been in the hands of physicians for her neurasthenic conditions all her life. I at once put her to bed, in a moderately darkened room, making everything as quiet as possible for her, with as little worry and vexation as possible. A week later I was called to the house by her husband, who said that she had become more blind. On examination I found a second hemorrhage, a little above the other hemorrhage and closer to the macula. At this time I put her upon iodide of potassium, saturated solution, with increasing doses. A few days later, I had another report of sudden dimness of vision, and found still another hemorrhage below the first one. This had followed an afternoon with many visitors, whereupon I forbade all company. On the 22d of January, her vision for the right eye was six one-hundredths, but under the influence of nerve sedatives, of the iodide of potassium and two months rest in bed, her vision had improved to six forty-fifths on the 25th of February. During all of this period there were times when she would complain of pain in each eye, but when questioned closely it faded away or amounted to only a smarting of the lids, or the neuralgic condition in the supra or infra orbital notches. On the 12th of May, under a mydriatic, her vision of the right eye was six twenty-fifths and the left, six fifteenths. By using a cylinder of minus 0.62 at 180°, her vision was brought up to six fifteenths in the right, and with a cylinder of minus 0.37 at 180°, to six-sixths in the left.

243-246 Broadway Block.

Keratitis and Conjunctivitis may be treated with massage and a sublimate-cocain salve. Sassaparel has found the following salve, followed by gentle massage through the closed lids, for a minute or two, extremely effective in cases of phylctenular keratitis, ulcers of the cornea, chronic conjunctivitis and episcleritis: cure in ten days at most: Five per cent. sublimate solution, 1 drop: cocain hydrochlorate 10 centigrams: vaselin, 4 grams.—*Sem. Méd., March 19th.*

THE
OPHTHALMIC RECORD.

A MONTHLY REVIEW OF THE PROGRESS OF OPHTHALMOLOGY.

VOLUME VII. CHICAGO, AUGUST, 1898. No. 8. NEW SERIES

EDITORIALS.

EXPERIMENTAL QUININE AMBLYOPIA.

As long ago as 1829 it was known that excessive doses of quinine caused obscuration of vision, but the study of fully developed and complete cases of quinine amaurosis began in America in 1879, and the papers of Voorhies, Roosa, Gruenning, Knapp, Michel, Atkinson and many others are well known. Since this time the literature has been enriched by numerous additional cases occurring in all portions of the civilized world, and from the clinical standpoint quinine blindness is one of the best studied of the toxic amblyopias.

Although the visual disturbances caused by this drug were noted in experimental work by Baldwin in 1841, the first careful research on quinine amaurosis in cats, rabbits and dogs was published by H. Brunner in a Zurich thesis in 1882. Eight years later the writer made some experiments on dogs to determine the lesion in quinine blindness, ard reported them to the College of Physicians of Philadelphia, and in the next year to the American Ophthalmological Society. Finally, Paul Barabaschew experimented with large doses of quinine upon healthy men, and studied the visual and general phenomena. These researches indicated that the lesion in quinine blindness was peripheral, that primarily there was an ischaemia of the retinal and optic nerve vessels cause by their intense contraction, and that if the blindness continued sufficiently long atrophy of the optic nerve and optic tract, as far as could be followed, associated with marked vascular changes characterized by vasculitis and endovasculitis ensued, and finally obliteration of the lumen of the vessels.

According to the writer's individual researches, the pathogenesis of the affection seemed to be somewhat as follows: In the earlier stages of the blindness, i. e., from the first to the fourth week (ophthalmoscopically pallor of the discs and great contraction of the vessels), the microscope revealed in the optic nerve imperfect differentiation of its fibrous trabeculæ, spreading apart of the individual nerve fibrils, which were beaded and varicose and beginning to be atrophic. At this time there were no changes in the vessels. Later, i. e., from two to three months after the onset of the blindness (ophthalmoscopically white discs and almost entire obliteration of the vessels), there was practically complete atrophy of the optic nerve fibres, thickening and collapse of the nutrient arteries of the optic nerve and occasionally (in two specimens) obstruction of the central vessel of the nerve with a partially organized thrombus. The atrophy extended throughout the nerve, chiasm and tracts.

At the meeting of the American Ophthalmological Society held at New London, in July, 1898, Dr. Ward A. Holden detailed the results of his experiments to elucidate the pathology of quinine amblyopia. In this investigation, to quote Dr. Ward A. Holden's own words: "A number of dogs were killed at periods ranging from two hours to seven weeks after the first injection of quinine, and the eyes, optic nerves, brains and cords were examined by the Nissl-methylene-blue method for cell changes and the Marchi-osmic-acid method for nerve fibre changes. Retinas examined on the third day after several toxic doses had been given revealed degenerative changes in a few ganglion cells (vacuolation, paleness and absence of chromophylic granules and breaking down of the cell body) and changes in the nerve fibres (a deposition in the nerve fibre layer of large globules of a myeline-like character). On the ninth and seventeenth days more ganglion cells were found affected and more myeline globules were present. On the seventeenth day the first changes in the optic nerve were noticed, consisting in a breaking down of the medullary sheaths of a number of fibres. On the forty-second and forty-seventh days the ganglion cell layer and the nerve fibre layer had almost entirely diappeared, leaving large cavities, and the myeline globules were no longer present. Many of the fibres of the optic nerve were broken down and the degeneration of the nerve could be traced up to its fibres in the external geniculate body and pulvinar." In other words, again to quote Dr. Holden: "With the lessened but not obliterated blood supply due to spasm of the vessels in quinine poisoning, the less resistant elements of the inner layers, the ganglion cells and nerve fibres, break down, while the cells of the inner nuclear layer are not visibly affected. An ascending degeneration of the optic nerve fibres follows the retinal changes. No histological alterations at this period are found in the retinal vessels, or in those of the optic nerve."

The experiments of Brunner and the author were performed at a time when the newer histological methods employed by Holden were unknown. It is now evident from Holden's admirable research that what they observed were the *secondary effects* of the toxic action of this agent which *primarily* attacks the ganglion cells and causes the ascending degeneration of the optic nerve and the tracts to which reference has been made. The vascular changes which the writer particularly described would seem also to be secondary results, and it is probable that the appearances in the central vessel which he depicted and ascribed to a thrombus, in the light of Holden's examinations, must be regarded as a natural phenomenon in the central vein in the dog's optic nerve, and not one really due to the action of the drug.

The gaps in our knowledge of the pathogenesis of experimental quinine amblyopia have now been filled with one exception, namely, the primary contraction of the retinal vessels which causes the ischaemia, and which the writer and other authors have attributed to the effect of highly cinchonized blood upon these vessels—an explanation, however, which is not very satisfactory.

It is needless to point out the wide field of research which Holden's characteristically excellent labors have opened, and it must be admitted that they afford strong confirmatory evidence of Nuel's theory that the amblyopia caused by tobacco and other drugs is not primarily an affection of the optic nerve, but an ascending degeneration due to destruction of the ganglion cells of the macula. The study of ganglion cells with the older methods, such, for example, as Sachs and the writer have made, are not sufficient and do not show the changes which can be developed by the Nissl stain. Exactly as new methods of histological research have changed entirely our conception of the histology of the nervous system and of the earliest pathological changes to which its ultimate structures are subjected, so, also, doubtless they soon will lead to surprising revelations in ocular pathology.

G. E. DE SCHWEINITZ.

HEREDITY IN THE COLOR OF THE EYES.—E. Storen states that in over 74 per cent. of several hundred persons he has examined, the color of the eyes can be traced to inheritance from the grand-parent of the same sex on the side of the parent of the opposite sex; boys from their mother's father and girls from their father's mother.

REPORTS OF SOCIETIES.

VIENNA SOCIETY OF PHYSICIANS.

MEETING APRIL 15, 1898.

Translated and abstracted from Die Ophthalmologische Klinik, May 5, 1898.

BY H. V. WÜRDEMANN, M.D.
MILWAUKEE, WIS.

Elschnig, "*Loss of Vision through Lead Poisoning.*" It is remarkable that relatively little is known of the ocular symptoms caused by lead poisoning. The changes have only been observed in chronic cases, and most seldom in the muscles. There are only sixteen cases of uni- or bilateral ocular muscle paralysis described in all the literature. The prognosis is somewhat unfavorable. In two cases the paralysis persisted, and in one irritation of the sympathetic. Isolated sphincter paralysis with or without complication of the accommodation has been observed. In Redlich's case there was pupillary paralysis, and on postmortem, sclerosis of the posterior spinal columns was observed.

The affections of vision are of much greater interest, the appearances being changeable and not pathognomonic. Schroeder collected fifty-five cases of saturnine amblyopia, which is an early symptom. The amaurosis was accompanied by interstitial nephritis, and the two affections may be ascribed to the same cause. No special portion of the visual pathway seems to be exempt, which explains the many varieties of the disease. Retinitis and intraocular neuritis of all grades appear. In simultaneous encephalopathia saturnina the clinical aspects of a brain tumor may be simulated. This was the case in one of the author's patients, in which bitemporal hemianopsia occurred as in the case described by Westphal. In another case there was great serous exudation in the papilla, accompanied by remarkable thickening of the vessel walls. The result is usually neuritic atrophy. Only in very mild cases, and in those which have no symptoms such as observed by Sowers, can there be any improvement.

Retrobulbar neuritis occurs next frequently, and may begin as well with central scotoma as with peripheral contraction of the visual field. Ophthalmoscopic examination is negative at first; later the affected portion of the papilla becomes blanched. Only in recent cases the prognosis is relatively better than in alcoholic retrobulbar neuritis.

Saturnine amaurosis was known before the era of the ophthalmoscope. To this time there have been reported six cases of sudden and complete blindness, which lasted for hours or days. The fundus was normal, the pupillary reaction retained ; the cause was esteemed of reflex character. The question of a peripheral causation may be raised, as in a case E. reports in which there was spastic ischemia of the retina.

There is as yet no satisfactory explanation of the origin of lead intoxication. In muscle paralysis it is supposed to be in the individual parts of the nerve tracts. Eichhorst compares all the probabilities by which damage to the vessels occurs. From the character of the ocular muscle paralysis in lead poisoning a lesion of the nerve stems must occur, which by Mannaberg and Pal has been denominated neuritis, and by von Chrostek to be a pressure paralysis caused from the edematous swollen brain on the nerves at the base of the skull. Central affections, the isolated sphincter and accommodative paralysis and also the rise of typical tabes dorsalis are to be explained by these effects of lead upon the base of the brain. It would be well to know what role the fluctuation in the caliber of the blood vessels and the blood pressure may play, as well as the consecutive inflammatory vessel changes. The principal site of the pathologic process in retrobulbar neuritis is to be found in the canalis opticus, the disease in the nerve bundles shuts up large arteries. Hemiplegic symptoms occur through spastic ischemia, which explains the negative fundus of Westphal in encephalopathic saturnina. Elschnig recommends massage of the eyeball, and in those cases where there is seeming improvement, paracentesis of the anterior chamber.

Basch pointed out the similarity of the ophthalmoscopic appearances in animals in which iodin had been injected into the circle of Willis. The immediately occurring amaurosis and weakness are due to increase in the intracranial pressure.

Elschnig remarked that he had spoken upon actual swelling of the brain, but not increase of pressure, that the arterio centralis retinæ is well connected by anastomosis with the internal carotid, and that increase in intracranial pressure did not explain the symptoms observed.

CHICAGO OPHTHALMOLOGICAL AND OTOLOGICAL SOCIETY.

MAY 10, 1898, DR. MONTGOMERY IN THE CHAIR.

DISCUSSION ON ESSAY OF DR. HOTZ.

Dr. Würdemann: I have been interested in Dr. Hotz's successful case, particularly as this morning I removed an eye that I had been nursing for four weeks, not believing that it contained a foreign body.

In the case of a gentleman who was hammering on a box with a hatchet, a piece of the hatchet broke off and flew up in the eye. One day and a half later I was summoned and found a lacerated wound of the cornea, prolapsus of the iris and evident infection. I took him to the hospital, cleaned out the wound and cut off the prolapsed iris. Infection of the wound and track of the foreign substance through the lens ensued, but not sufficient to produce more than slight irritation and slight iritis. The history of the case seemed to show that the foreign body was a large one. No ophthalmoscopic examination could be made, but from the character of the injury it seemed that the foreign body was not in the eye, and I so expressed myself.

Having some doubts on the matter, about three weeks afterward, I had a radiagraph made, which proved that I, as well as others who have seen the case, was mistaken, and that the foreign body was in the eye. I brought with me this evening a radiagraph which shows it very distinctly. The exposure was of ten minutes' duration and at one-half meter from the patient, with the patient's eyes closed. There have been no ill consequences from the radiagraph.

This morning, after incision into the cornea, I tried to remove the foreign body by the electric magnet, using one that would hold up one pound weight. Of course at this time there had been sufficient exudation and organization in the eye that it would have been difficult to remove the foreign body, even by the large electric magnet, had I possessed one. In this case a cataract formed, but the lens did not swell appreciably. I went through the lens, removed the debris, inserted the magnet as deeply as I dared to, first in the direction in which I believed the foreign body existed, without success. I passed the magnet through it in all directions without being able to remove the body; then the enucleation of the eye was done, and the body was found in exactly the position where the radiagraph showed it, in the anterior portion of the vitreous, but covered with a mass of firm exudate. In six cases I have removed pieces of steel by the magnet from the iris and lens, but have never been successful in removing a piece of steel from the vitreous with the magnet.

In this case but little operating was done to the eye at first on account of the infection of the wound. The best time to use the magnet is as soon as possible after the accident; in that way we can often withdraw the foreign body through the wound of entrance, the course in which there is the least resistance.

Dr. C. P. Pinckard: I take it Dr. Hotz reported this case particularly, because the foreign body was removed through the wound entrance. The only successful case I ever saw where a foreign body was removed from behind the lens was one in which a piece of steel was removed through the wound of entrance. In almost every case which I have seen, the eye was blind within a year afterward. This particular case was a piece about eight millimeters long and four thick, a piece of a chisel that went straight through the center of the cornea. The case was sent at once, so that I saw it inside of an hour after the injury. The first time the magnet was introduced I got the click, the second time the steel came to the lips of the wound, and the third time I got it out. This was about four years ago, and the patient's vision now is about one-tenth in that eye. I have seen several cases where the eye has been saved, but there was no vision.

DISCUSSION ON DR. HOTZ' PAPER.

Dr. Henry Gradle: Among eight cases I have had two perfect instances of success in removing steel chips from the eye with preservation of sight. One was a watchmaker seen on the fourth day. The chip (one by two millimeters) had entered through the sclera, and could be distinctly seen with the ophthalmoscope peripherally. The minute wound was, of course, closed; there was only moderate ciliary injection, but considerable vitreous haze, especially around the foreign body (V. 22/100). I entered through an incision in the sclera, and almost at once heard a click. There was no reaction; the vitreous cleared, and two months later sight was 20/30, with still a slight zone of haziness visible ophthalmoscopically next to the wound. Nearly a year later I understood that the eye had not changed.

The second case was a young physicist, who felt a blow during some mechanical experiments, followed by some dimness. The eye cleared, however, and a physician called at once claimed that no foreign body could have entered. He returned six months later on account of failing vision.

Sight was now 20/70, uncertain, as the entire upper half of the field of vision was gone. The line of separation, however, was not straight, but concave toward the upper side, and not well defined. No wound was visible, and the eye was pale; pupil had dilated gradually since the accident, and was now largely immobile. There was slight diffuse vitreous haze, while downward there were peculiar whitish flakes like pledgets of cotton almost in the vitreous, and apparently some adherent to the retina. There was some irregular pigmentation and a considerable granular or "salt and pepper" appearance of the retina. Quite peripherally downward, the foreign body was visible. The retina showed the condition of siderosis described by Hippel. The arteries, narrowed in the upper half, were mostly obliterated in the lower part of the retina; the smaller ones emptied and changed into white cords; the larger trunks still containing a thin column of blood. The magnet extraction was easy. The chip (about two by three millimeters) crumbled on pressure, but as all the fragments adhered to the magnet and no ophthalmoscopic appearances indicated any remnants, I felt everything had been extracted. There was no reaction. Eight months later, vision was the same, perhaps a trifle more positive, but still with absence of half of the field. The vitreous flakes had disappeared; the retina looked more healthy; there was less pigmentation, but the sclerosis of the vessels had perhaps increased a trifle in the lower half.

Dr. H. V. Wurdemann: The six cases in which I believe I have been successful in the removal of steel were in the anterior part of the eyeball. This is the only unsuccessful case in the removal of steel from the eye which I have had with the magnet; the other cases have been successful. A peculiar click with which the foreign body comes to the magnet is decidedly diagnostic.

Doctor Wilder: The results of such cases as those of Doctors Hotz, Wurdemann and Gradle are certainly very brilliant, but I am satisfied such results encourage this operation altogether too much. If we only knew the after history of many such cases, we should probably know of a great many cases of detachment of the retina, resulting from ineffectual efforts to remove a piece of steel which does not do nearly as much harm as the magnet introduced by the surgeon. He introduces his magnet into the original wound of entrance, or into an opening made for the purpose, wounding the vitreous more or less extensively, and naturally produces a condition which frequently in later years leads to detachment of the retina and ocular destruction. I believe if all cases of operation by the magnet were reported after the lapse of several years, we should find that the number of successes would be a very small minority, certainly not sufficient to justify doing the operation as often as it is done. Positive indications for this operation exist when the steel can be diagnosed as lying in the iris or lens, or when it can be seen in the vitreous. If it lies adherent in the choroid, and the eye is quiet, I can see no occasion for an attempt at its removal ; and if it is left, nature will cover it soon with an exudate which will be a protection. Doctor Wurdemann's case shows the futility of operation in some cases even if the steel has been localized. To operate when it can not be localized seems to me injudicious.

Doctor Tilley: I exhibited two cases early in the history of this society with steel visible in the retina. In both cases the steel seemed to have passed through the eye almost without leaving a trace, and the wound healed kindly. The patents were not suffering. There was some limitation of vision. One of those cases I think Dr. Fisher showed something like eighteen months or two years afterwards. The history showed an attack of grip associated with almost entire loss of vision. I exhibited them to the Society several months after I discharged them. They were not annoyed much; vision was not much interfered with, and the steel was encapsuled.

Dr. Wm. T. Montgomery: About the only case of successful removal of steel from the fundus was one in which I introduced the magnet through a new opening. The case came under my observation within an hour after the injury, and there was a small opening near the periphery of the cornea, and also one opposite in the iris. Using the ophthalmoscope I readily located a bright bit of steel in the fundus external to the macula. I cocainized the eye immediately, and instead of cutting through the original opening I turned the eye out and down and made a flap with the knife through the sclerotic, between the superior and the external rectus. I thus introduced the magnet only a short distance, through the vitreous, and at almost the first effort I felt the click and withdrew the foreign body. I stitched the conjunctiva and closed the flap, and the patient recovered with useful vision. There was a little clouding of the vitreous so that the vision was only about 20/50, the last time I saw the patient. There was no reaction whatever.

Recently I saw a unique case of a foreign body. The patient came two days after the injury. The injured eye was blind, there was a dense cicatrix extending across the cornea, and a recent injury had torn it open, making a wound extending almost across the entire width of the cornea; there was great chemosis with symptoms of sepsis and I advised enucleation. The patient said that he had a similar injury eighteen months before and the doctor wanted to remove his eye, but he would not consent, and saved it. I told him he might save his eye again, but my advice was to have it removed. He was in the hospital and I think at the second visit he decided to have the eye removed, as it had become very painful. I made evisceration and found the last foreign body, the corner of a hammer, a kind of a triangular pyramid, weighing fifteen to twenty grains, and back of that I found another slug that had gone in eighteen months before.

Dr. Haight: A patient consulted me complaining of pain in the right eye, which had been blind for sixteen years. He was a carpenter and injured the eye sixteen years ago, followed by severe inflammation. The iris was attached firmly to the anterior capsule, and to the temporal side of the pupil was a small black corneal speck which appeared to be a piece of metal, which he decided to have removed. I took a piece of nail out of the eye that was about one-third of an inch long, which had passed through the cornea, iris and lens, and had remained in the eye all that length of time. He had had no inflammation of the eye during those sixteen years. After the removal of the steel he would not have the eye enucleated. I saw the patient about six months later, the eye was quiet. It shows the length of time that a piece of metal will remain in the eye when it is not in contact with the ciliary body without producing inflammation or irritation.

Dr. Hotz: In closing the discussion I will take the opportunity to make a few remarks in regard to the views expressed by Dr. Wilder. It seems to me his position can not be sustained by clinical facts, if he says that the magnet does more harm to the eye than the foreign body, and that nature will cover the foreign body with an exudate to make it innocuous. I think it is a well-known fact that nature does not do anything of that sort as a rule, and that the foreign bodies in the posterior part of the eye, in the majority of instances will destroy the usefulness of the eye and prove a source of danger to the other eye. The object of the magnet extraction of the foreign body from the eye in the first place, is to save that eyeball for the patient, even if no sight is to be saved; for the blind eye, even with a detached retina, is certainly better for that patient than a glass eye; and, therefore, even if it were true that the disturbance by the magnet in the vitreous leads to detachment of the retina, that should not debar us from doing the operation, if we have a good prospect of preventing the deleterious inflammations, cyclitis, etc., that the foreign bodies are apt to set up. To remove the foreign body, as the doctor says, when it is located in the iris and lens, and in the vitreous only if it can be located with precision, is another remark which surprised me, because it is just in the iris and in the lens that foreign bodies may remain a good while, and in the lens particularly without doing any particular harm, except clouding up the lens, but not endangering the future of the eye.

I wish to say that I am far from encouraging the promiscuous operations, if I may so say, and I have taken opportunity in the past to discourage the use of the magnet for removing a piece of steel in the eye when an extensive cyclitis has taken place which in all probability will destroy the eye, whether the foreign body is retained in it or whether it is extracted. But I advise the operation in the early stage, as soon as possible after the accident, especially before any inflammation has set in; and I do the operation, as I have said, in the first place, for the purpose of removing the cause of deleterious inflammation, to preserve the eye, no matter whether or not in that eye, the sight will be restored. In the case I have reported, where the foreign body was lodged in the ciliary portion of the choroid, I think it would have been very risky, and on my part reckless, to leave the foreign body in its position, because in that vicinity it was bound to set up inflammation sooner or later that would lead to the destruction of that eye and probably jeopardize the other eye.

W. A. Fisher: One would think from the many favorable reports of magnet operations that a good result should be looked for in many cases. On the contrary it is rare to retain serviceable vision after removing a piece of metal from the interior of the eye. This should not condemn the magnet, for when we have a piece of iron or steel in the interior of the eye conservative surgery demands the removal of the metal, first with the magnet, and, if unsuccessful, removing the eye.

Many of you will remember the two cases shown the society by Doctor Tilley several years ago. In one a piece of metal was shining in the choroid, and I am sure none of you would have suggested surgical interference at that time. The media was clear; had one-half normal vision. I saw this same man eighteen months after. He had received an injury in the fellow eye. The injury was not serious, and he made a rapid recovery. The eye that had the steel in the choroid was in a serious condition; the lens was opaque and a mild cyclitis existed. I advised removing the eye, but the patient would not consent. I am sure he would have been better off without the eye.

This was one of the most hopeful cases I have ever seen, at the time Doctor Tilley presented it to the society, but I am of the opinion that any one, with a foreign body in the interior of the eye, would be in better condition if we would insist on removing the offending substance, even though we sacrifice the eye. I consider an operation with the magnet quite successful when we succeed in removing the metal regardless of what vision is left, for preserving the ball is better than an artificial eye.

Doctor Wilder: I did not wish my remarks to be interpreted as criticising the paper of the evening, but I merely wanted to express the idea that the brilliant results that are recorded in electro-magnet operations may encourage just the sort of promiscuous operations with the magnet which Doctor Hotz has just condemned. I therefore stated that to my mind the indication for the use of the magnet was when the foreign body could be seen in the iris or vitreous. When it is impossible to localize it, we are not even certain of its existence in the eye; and in such cases I should resort to the use of the electro-magnet only when the indications were grave enough to justify the immediate removal of the eye in the event of failure to find the foreign body with the magnet.

Dr. Henry Gradle—Operation and After-Treatment of Cataract: To minimize the danger of cataract operation, we should aim, first, to have the patient in the best possible state of health; secondly, to guard against avoidable infection. On the first subject I can state nothing but self-evident truths. If the patient has passed through any disease likely to interfere with his resisting power for the time being, it is of course to his interest to defer the operation. Cataract is not an operation of emergency, but one for which the time can be selected. If, therefore, he is in a condition at the time which may in any way endanger the success, delay is advisable. Thus the persistence of a severe cough, or any form of intestinal disturbance likely to prevent the quietude of the patient, should cause us to delay. Whether in diabetes, so frequently a cause of cataract, we should delay the operation until we get the effect of an anti-diabetic remedy, is perhaps an open question. The results of operating during diabetes have not been unfavorable on the whole, but it seems to me wiser to diminish any possible source of trouble by reducing the excess of sugar, for clinical observation has shown that diabetic patients are very liable to pyogenic infections.

Of more importance is the second division of our subject—namely, the combatting of any avoidable source of infection. The most important topic to which I can refer is, of course, purulent inflammation of the tear sac. Unless it is absolutely unavoidable, we should never perform a major operation on the eye while the tear sac secretes fluid. If there is no time for the cure of the condition, we must resort either to extirpation, or at least to temporary exclusion, by completely closing the puncta with the cautery and assuring ourselves that they are absolutely closed.

In case of conjunctival disease, the operation should also be deferred until an absolute or relative cure is obtained and no further secretion exists. Blepharitis, too, should receive attention before an operation is attempted. At the time of the operation we should sterilize the skin and lashes by scrubbing with soap and water and any efficient antiseptic, so as to obtain as sterile a neighborhood as the general surgeon would demand. It is a different question, however, regarding the conjunctiva. Observations have shown that the conjunctiva, even when normal, has harbored germs, sometimes virulent germs. The observations by Gelpe have made it likely that the more normal the conjunctiva, the less is the probability of existence of pathogenic germs. This would, indeed, agree with clinical observations as to the danger of the operation. It has, however, been shown conclusively by Randolph and by some continental oculists that it is impossible to sterilize the conjunctival surface either by flooding with sterile fluids or with efficient antiseptics. The latter, especially corrosive sublimate, are not merely useless, but absolutely undesirable, on account of the irritation to which they give rise. By reason of the secretion which they produce, I would consider them a menace instead of a benefit. We must, hence, take our chances at present as regards infection from the conjunctival surface and simply avoid the possible infection from impure skin, soiled lashes, or infected instruments.

Dr. Wm. T. Montgomery—Incision: I think we will all agree that incision is a very important part of cataract extraction, and a very important item in incision is a proper knife. In the first place, the knife should be of as keen an edge and point as we can get, and my preference is for a moderately broad knife—at least two and one-half millimeters in breadth.

Now as to the incision—I have made various incisions. I began first with the Van Graefe modified linear incision, and followed that for a number of years, and changed for one that was almost entirely in the cornea, but for the past eight or ten years I have made the incision as nearly as possible just back of the limbus, including about one-third of the circumference of the cornea in the cut and making the incision entirely in the opaque tissue back of the limbus and terminating with the conjunctival flap. I make this incision, whether I make simple extraction or extraction with iridectomy. It is essentially what is known as the old flap. The objection urged against the use of this incision in simple extraction is that we are more apt to get prolapse of the iris. This has not been my experience with this incision. The great advantage of this incision, terminating with the conductival flap is prompt healing and a quicker closing of the wound than when the incision is made in part or in whole in the corneal tissue.

Dr. Hotz—Iridectomy: As a safe advice to beginners I should say, by all means operate with iridectomy, because that operation is applicable in all cases; because the delivery of the cataract is easier, and the removal of the cortical remains can be more thoroughly done after the iridectomy than through the intact pupil.

I know it has been said that those who perform an iridectomy must give good and sufficient reason for justifying the mutilating of the eye. That is true; we should avoid mutilation if without it we can accomplish our object with safety and without taking any risks. Now are there any advantages in the simple operation? The cosmetic advantage of the central round pupil counts for little. The eye is hidden by the thick glasses; it takes a close inspection to see whether the pupil of that eye is mutilated or not. I have never in my life heard a cataract patient complain of mutilation, or about any annoyance that could be referred to the iridectomy. The vision in the eyes operated upon with the iridectomy comes up to the same standard as in eyes with the simple operation. We have all varieties of vision in one class as well as in the other. That is about all there is to say about the advantages of leaving the pupil intact. But, on the other hand, we have always to fear prolapsus of the iris, which happens to all operators; no matter how experienced an operator is, he cannot foretell in a given case whether it will happen or not; and if it does occur the immediate excision of the prolapsus will change the condition of the eye to the same as if the iridectomy had been done at once; or if the prolapsed iris be not removed it will set up troublesome inflammation of the eye and lead to unpleasant results. I feel much safer and easier in mind about the operated eye, when iridectomy has been done than when it has not been done, and, therefore, as a rule, I adhere to the operation with the iridectomy.

For a while I have been a sort of an eclectic. After having made the incision I let myself be guided by the behavior of the iris. If it remains quiet in the eye and does not prolapse at once, or if after the removal of the cataract the iris promptly slips back into the eye, I abstain from iridectomy, relying upon the sphincter muscle to hold the iris back in the eye if the wound should open again and the aqueous humor escape. That seemed to work in a number of cases very nicely; but sooner or later I had some bad results. In spite of good behavior of the iris during operation,—on the next day in opening the eye, I sometimes found the iris protruding, and while in some cases the excision of the prolapsed iris quieted the eye, in two instances it did not arrest the cyclitis, and the eye was lost; in one case, it even necessitated the subsequent enucleation of the eyeball.

Dr. C. H. Beard.—Capsulotomy and Expression: Mr. President and Members of the Society:—Concerning capsulotomy and expression of the lens, I shall state briefly my experience as to what I have found to be the best methods.

First, about the cystotome,—I have chosen a modification of the old Graefe instrument. The Graefe cystotome, as you know, sets nearly at a right angle; it is, indeed, too angular an instrument. It is the very point of the cystotome that is the essential feature. If the point of the cystotome sets at a very acute angle, and the point is exceedingly sharp, that is all that is necessary. As you all know, a very sharp needle will scratch through a very tough membrane quite easily. I discarded the Graefe cystotome because it has the angular heel. Where the pupil is small, as, for example, in simple extraction, I found it difficult sometimes to push the angular heel of the Graefe cystotome beneath the iris so as to get a sufficient cut. For that reason I have chosen a modification of the Graefe cystotome,—I think it is Dr. Knapp's,—which has a rounded heel. This cystotome has a perfectly straight, stiff shank. I do not like a malleable shank for the reason that in rotation, if it be bent, it does not rotate in line with the handle, as it should, but curves around, the cutting portion describing the arc of a large circle.

In the introduction of the cystotome too much stress cannot be laid upon detail. I have seen a great many operators push the cystotome in, apparently without any regard to the direction of the heel, or the point, and without any regard to the direction of the handle. Now, whether one is ambidextrous or not, whether he can operate behind a patient with either hand, or whether, for the left eye, he has to go around in front of the eye, I think it is best to lay the cystotome flat on the eyeball, behind the incision, with the point directed backward; make gentle pressure so as to depress the posterior lip, and slide the cystotome in, with the handle horizontal. If it be the right eye, with the right hand; if it be the left eye, with the left hand, the operator holding the cystotome with the thumb and index finger in such a manner that he can give the instrument a half turn toward him—that is, turn the point from backward to forward with his finger and thumb, simply by rotation. Having pushed the cystotome, heel foremost, into the incision, pass it down flatwise between the iris and cornea, if it is a simple extraction; or between the anterior capsule and cornea, if an iridectomy has been made, until you reach a point where you desire to make the cystotomy; then push it beneath the iris so as to get a full incision, turn the handle toward you one-fourth of a revolution so as to bring the point in contact with the capsule, or the plane of the cystotome at right angles to the anterior surface of the lens, and then make the cut. I am speaking, of course, of a more or less transverse cystotomy; then make the rest of the half-turn after your incision is completed, bringing the heel backward, and withdraw the instrument so as not to catch the point on any portion of the eye.

I practice the so-called peripheral cystotomy. None of us, I think, make cystotomy at the very periphery of the lens, opposite the equator. That would be a very dangerous proceeding, as one would risk cutting the zonule and cause the vitreous to present before the lens; but I make an incision *parallel* with the periphery, at a certain distance from the lens border. I have not had experience in making any other cystotomy, as, for instance, that practiced by Trousseau, of Paris, which consists in combining capsulotomy with the primary corneal incision. Nor have I ever tried tearing off and removal of the anterior capsule with forceps, as for a time practiced by Foerster, Schweigger, DeWecker, and others, a method which has, very justly, fallen into disuse.

With regard to the expression of the lens, first, the spoons that are required should be well chosen. I prefer a Graefe spoon for the pressure from below, and a flatter spoon for pressure behind the incision. The flat spoon is laid with the convex side down just back of the incision, and the smaller spoon is placed as far down as the lower fornix of the conjunctiva, and both spoons are pressed toward the center of the globe. After the lens is fully presented in the incision, the lower spoon is slipped over the cornea, as, with gentle pressure on the spoon, the smooth convex side will not do any harm to the cornea, but at the time the lens is about to make its exit, when the thickest portion of the lens is engaged in the opening, or, to be more exact, when the thickest portion of the lens has just passed the incision, it is better to let up all the pressure on the lower spoon and see if the lens will not come out spontaneously without any further pressure. For if the lens is made to pop out suddenly, the patient is very apt to give a tremendous squeeze and eject the vitreous also. Many of you have doubtless observed how prone is the orbicularis to forcibly contract just as the cataract has made a sudden exit.

As for those soft portions of a lens often left behind, deft and gentle manipulation with the spoons is sufficient, as a rule, to remove them. If for any cause they hang behind, if they get caught back of the incision, or stick and lag, I think it is best to use a spatula, insert it in the incision, press it backward very gently, and then with the Graefe spoon slide the cortex up and out along the spatula to delivery. I consider expression of the lens, or cortex, by means of the fingers acting through the lids not only inelegant, but dangerous as well. Both in the cystotomy and in the delivery of the lens I prefer to have the eye free. Not because it would not be better, perhaps, with a competent assistant, to have the eye fixed, but assistants are too precarious, there are too many kinds, so I would rather, on the whole, have the eye free.

Where the accident occurs of the lens dropping down into the vitreous chamber, I always use the sharp hook of Tyrrell, insert it flatwise, push it down flatwise behind the lens, turn the point forward, dig it into the lens and lift it out. This I have done repeatedly in such cases without the slightest loss of vitreous. It is wonderful with what ease one can, in this way, deliver a recalcitrant lens. A great deal depends upon the shape of the hook. I think most all the makes in the market are too much bent, they most all come around until the point is directed parallel to the shank. Such a shape would be of absolutely no value at all, it must be wide open, the point almost at a right angle to the handle, and very sharp.

When an extremely rigid pupil is encountered, which would necessitate considerable pressure on the spoons to overcome, I believe the wisest and safest resort is iridectomy in preference to cutting of the sphincter with scissors, or otherwise fussing with the obstruction.

Dr. Casey Wood—Dressings: Not being present Dr. Woodruff read his remarks that were identical with a similar report presented to the meeting of the ophthalmic section of the American Medical Association at Philadelphia in 1897, and published in the transactions of that year.

Dr. Würdemann—Secondary Operations: The preparation of cases requiring secondary operation after cataract extraction depends largely upon the method of operation, the condition of the capsule and upon the complications. We may have almost any operation to do after the extraction of cataract, if the case proves to be complicated. The question of discission of the lens capsule is one which I have to meet on account of the method which I pursue, that of peripheral capsulotomy, in which in probably six cases out of ten it is generally necessary to do a secondary capsulotomy. This capsulotomy is made through the cornea. I have never operated posteriorly, as that method is out of date. The operation is done in my hands by the bimanual method rather than by the single needle. In quite a proportion of cases it is, however, necessary to divide the capsule, or the secondary cataract where the capsule has been thickened by secondary inflammation, by scissors, and this is done after incision by the keratome through the cornea. Preferably here I would use the Knapp's capsulotomy knife needles, Desmarres' scissors and the capsulotomy forceps of Knapp, or those modified by Eugene Smith, of Detroit. I have found it usually necessary to make but one capsulotomy, although in some cases I have been obliged to attempt capsulotomy two or three times, after using the needle method. The needles should be sharp-cutting knife needles, those of Knapp's preferred. The operations of iridotomy, secondary iridectomy, iritoectomy, etc., or others of that nature may likewise be necessary. A secondary operation sometimes necessary is that of a removal of iridic cysts. These are preferably to be dealt with by incision and compression, rather than cauterization.

BERLIN MEDICAL SOCIETY.

MEETING MARCH 23, 1898.

Translated and abstracted from Die Ophthalmologische Klinik, May 5, 1898.

BY H. V. WÜRDEMANN, M.D.

MILWAUKEE, WIS.

Greef, "*Acute Epidemics of Ophthalmia*," is of the opinion that epidemics of eye diseases have been very much overrated as regards their danger. No year passes in which an alarm is not carried abroad that Egyptian ophthalmia is again spreading with the same terrible results as had been observed in the first part of the nineteenth century at the time of the Napoleon wars. Accordingly the most strict rules are promulgated, nitrat of silver and blue stone taken up and the epidemic reduced without any evil results. The therapy, as has been reported to the government, has proved brilliant. It is difficult, almost impossible, to find anyone who has been seriously threatened by this disease. Greef may be esteemed an authority on these epidemics, as he was government commissioner in Berlin and traveled for two years in the trachoma districts. That these acute epidemics have nothing to do with trachoma can be said with safety, because they have been thoroughly studied, both clinically and bacteriologically. The expression "contagious epidemic" is accordingly not always synonymous with trachoma; a practical and very important statement relative to the therapy.

These epidemics have been commonly described under the name of "contagious epidemics," but are nothing else than a congery of complex symptoms, first described by A. v. Graefe under the name of acute inflammatory catarrh (acuter Schwellungscatarrh). The course of this disease is favorable. It is quickly developed, and quickly disappears. It is accompanied by considerable swelling of the conjunctiva with moderate photophobia, and after two or three weeks, in case earlier healing has not been induced through proper treatment, the eye is again normal and uninjured. Such epidemics occur in people who are free from trachoma as well as in those who have that disease. They are clinically and etiologically to be separated from the ordinary Egyptian epidemic. As an example Greeff quoted the high artillery schools in which during the previous year in the course of three to four days the entire establishment had been affected and in the same length of time had disappeared. From a bacteriologic standpoint these acute epidemics may be divided into four groups: 1. Pneumococcus conjunctivitis (as described by the Institute Pasteur). 2. Conjunctivitis through diplococci. 3. Conjunctivitis through microörganisms. 4. Conjunctivitis through strepto- or staphy lococci.

The clinical symptoms in all cases are the same. Great swelling, myosis, muco-purulent secretion and .quick spreading in closed institutions and families. From these purely local epidemics there is another to be distinguished, which spreads through entire countries, kingdoms and provinces. It is characterized by considerable enlargement of the follicles. This disease proceeds without irritation. The fact that it is often accidentally discovered shows how little inconvenience it causes. It looks like follicular catarrh and ordinarily causes neither redness nor swelling nor subjective symptoms. These so-called epidemics are generally found in examination of schools and seem to be entirely harmless. According to Greeff 25 per cent. of all Berlin school children have this disease. One could at any time construe an epidemic.

The causes of this condition are not entirely determined. Bacteria cannot be excluded while its artificial propagation from person to person has not been accomplished. Probably generally poor hygienic conditions are the causes, which may account for the fact that the disease was found in schools and factories. Generally the air is thick with exhalations and dust. This follicular swelling often occurs in children with the lymphatic diathesis, analogous to swelling of the lymphatic glands, and in chlorotic girls. A connection between follicular catarrh and trachoma, in the sense that the disease may be merged one into another, cannot be true. It is likewise evident that in trachomatous regions follicular catarrh may become trachomatous. Upon these facts Greeff bases a proposition that a difference should be made between follicular catarrh and trachoma, in order to prevent unnecessary alarms.

ZURICH SOCIETY OF PHYSICIANS.

MEETING NOVEMBER 20, 1897.

Translated and abstracted from Die Ophthalmologische Klinik, May 5, 1898.

BY H. V. WÜRDEMANN, M.D.
MILWAUKEE, WIS.

Fick. "*Two cases of Ciliary Nerve Resection, with Preservation of the Optic Nerves.*" Had tried this procedure in order to influence the healing of bad cyclitis. In the first case the eye was rendered free from pain eight days after the operation, and in one week was no longer inflamed; the greatly reduced vision was improved in a couple of months and eventually raised to what it was before the beginning of the inflammation. In the second case F. made this operation twice, the first being insufficient, the greater part of the cornea retaining its sensibility. The result upon the inflammation of the first operation was incomplete; the eye was paler than before, but did not become quiet and gradually lost vision. A second ciliary nerve section had the hoped for results referable to the inflammation, but was fated, on account of severe bleeding, to be blind for three days and to have exophthalmos. On the fourth day sensation of light and two weeks later good vision came back, but the final result was optic nerve atrophy with visual acuteness only 2-xxxvi, and contraction of the visual field.

He will in the future perform Krönlein's temporary resection of the orbital wall. He hoped by this to render the posterior hemisphere of the eye so free that all structures that might be cut would come into view and bleeding readily stopped before any noteworthy damage occurred.

Haab was of the opinion that by the operation the 'posterior ciliary vessels were also cut and this was a fault. It was of interest to know whether Wagenmann had observed degeneration of the fundus from his experimental resections of the posterior ciliary arteries. The hemorrhage and resultant blindness occurring in Case 2, are similar to the case of Gifford, who saw great bleeding into the orbit after extirpation of the lacrimal gland, which injured the optic nerve in a similar way. It was possible in Fick's case that the central artery of the retina had been torn by the hook placed around the optic nerve. The fundus appearances developed later resembled the so-called embolism of the central retinal artery. He was of the opinion that the operation, when done, should be combined with Krönlein's temporary resection of the orbit, in order to lay open to view the field of operation.

Fick replied that the ciliary arteries could be cut in the procedure without influence, the circulation being restored. The central artery was not torn. Changes in the fundus could not later be discovered.

Ritzmann. There must be a neuritis of the ciliary nerves in cyclitis, and different authors have described the inflammatory layer in the ciliary nerves of such eyes which had induced sympathetic disease of the other eye or had led to the same. This severing of the ciliary nerves cuts off the painful part supplied by them, part intra-bulbar, part extra-bulbar. In reviewing the beneficial results obtained by Dufour with subconjunctival sublimat injections in such cases, he asked Fick if he had tried them.

Fick stated that the supposition that the ciliary nerves were affected from within came from Graefe, but according to Snellen from without, and that in Snellen's case of a blinded eye with localized pain, the result of the operation was immediate and lasting. The subconjunctival injection method had not been used in these cases, as former trials with sublimat and saline solutions had given no encouragement.

A REPORT OF THE PROCEEDINGS OF THE SECTION ON OPHTHALMOLOGY OF THE AMERICAN MEDICAL ASSOCIATION.

Fifty-First Annual Meeting, Held at Denver, Colorado, June 7th to 11th, 1898.

BY H. V. WÜRDEMANN, M.D.
MILWAUKEE, WIS.

(*Continued from July Number.*)

Frank Allport, of Chicago, Ill., asked if holocain could be boiled without any injury to its efficiency. Answer: Yes.

H. M. Starkey, of Chicago, Ill., referring to Sisson's paper suggested that an easy means of carrying cultures or specimens of pus from the patient's house to the laboratory was by means of two microscopic slides or cover glasses, between which a small quantity of the secretion might be smeared.

R. L. Randolph, of Baltimore, Md., in closing the discussion, stated that he had one case in which holocain did not seem to anesthetize, but other patients might be found on which cocain did not appear to have an anesthetic action. Holocain was of special value, as its solutions were positively antiseptic.

Edward F. Parker, of Charleston, S. C.—"*Five Cases of Congenital, Bilateral, Symmetrical Displacement of the Lens of the Eye in Three Successive Generations.*"—The malformation known as ectopia lentis (congenital) is not commonly met with. Of fifty thousand patients of Knapp's, only ten were seen. Notwithstanding this, however, cases occurring in single individuals, or in several members of a family, have been frequently reported. Examples of the defect being transmitted for several generations of one family are on the contrary very rare and merit reporting. He detailed his own cases, occurring in a mother, daughter, and three grandchildren, and was able to collate all similar cases hitherto reported through the courtesy of DeBeck, of Cincinnati. In all his cases the direction of luxation was upwards, or upwards and outwards. In all the irides were tremulous, anterior chamber deepened, lenses clear, and eyes otherwise normal. A complete bibliography accompanied the paper.

W. H. Wilder, of Chicago, Ill.—"*Report of Some Cases of Hereditary Ectopia Lentis.*"—presented a diagram of cases of ectopia lentis. A woman, thirty-nine years of age, came to his office, bringing her child of ten years, who complained of bad sight. Examination showed extensive dislocation of the lenses; right outwards; left outwards and upwards. The mother said she had poor sight, and on examination her right lens was dislocated upwards and inwards and left upward and outward. She had four children, two had dislocation cf the lens. The other child who had this deformity was five years old, lens dislocated inward. In all these cases the lenses were perfectly clear and transparent. In all vision was considerably impaired, nor could it be improved with lenses, because the edge of the lens interfered. In all probability these are illustrations of dislocations occurring during three generations, because I found that this woman's mother was reported to have had very bad sight that could not be corrected by glasses.

Flavel B. Tiffany, of Kansas City, Mo., had reported seven cases of children in one family, in all of whom the lenses were dislocated upward and outward except in one, where the lens was dislocated inward. The lenses were perfectly transparent. On dilation, the vision was unimproved by glasses. In some of these cases he advised removal of the lens and adjustment of glasses, but the advice was not followed.

L. Webster Fox, of Philadelphia, Pa., spoke regarding the difficulty of operating in those cases on account of prolapse of the fibers, the lens floating upwards toward the ciliary region. In one case he delivered the lens with a scoop. It had the dark amber color characteristic of black cataract. Good recovery and vision followed.

J. E. Minney, of Topeka, Kan., reported one congenital case in a woman, aged 35, in whom the lenses were dislocated downwards and inwards. No improvement of vision could be obtained by lenses, thereupon he operated two months ago, finding instead of a lens a sac full of a whitish fluid, which was removed, the operation being attended by a prolapse of vitreous. Improvement of vision resulted.

H. M. Starkey, of Chicago, Ill., had seen a family of seven children and the mother with ectopia lentis. These were highly myopic, and ophthalmoscopic examination in the pupil out of the lenticular area showed still some myopia present.

Cassius Wescott, of Chicago, Ill., "*An Additional Case of Double Congenital Microphthalmos*," reported a case of double congenital microphthalmos in a male child, two years old. The patient was in perfect health at the time of the examination, and always had been well. There was no other physical anomaly. The family history was negative, except that another child, a girl, which had died at eighteen months, had similar eyes. The mother had borne only these two children, and gestation and labor was normal in both instances. Examination of the little boy's eyes showed that the lids and orbits were normal. Both eyeballs were smaller than normal, the cornea measuring not more than 6 or 7 mm. in the left eye, or 5 or 6 mm. in the right. The iris was present in both eyes, but the pupil could not be made out in either, because of opacity of the cornea. The right eye was smaller than the left, and the cornea was almost entirely opaque. The movements of the eyes were normal, and no cysts could be demonstrated in either orbit. The left eye possesses some vision, as the child could see to get about.

He reviewed the literature of double congenital microphthalmos.

Casey A. Wood, of Chicago, Ill., had personally no experience in these cases outside of some studies that he made with Mr. Lang, of London, a number of years ago, when an attempt was made to show that cases of true anophthalmos, one of the divisions of microphthalmos, was not possible. As was declared some years ago careful dissection will discover some parts of the eye, and in considering its embryology it would seem strange if entire absence of the eye were possible. The experience we had seemed to prove that we only have cases of true microphthalmos to deal with and that there is always some trace of the ocular structures to be found in the cranium.

D. C. Bryant, of Omaha, Neb., "*The Use of Aluminum for an Artificial Vitreous.*"

Some two years ago he commenced using an aluminum ball, instead of a glass one for an artificial vitreous as recommended by Dr. Mules, and so far has had nothing but very satisfactory results. The aluminum is much stronger and its specific gravity is less than that of glass. There is no danger of breaking in handling, or in boiling to render the ball aseptic before using. In cheapness the aluminum ball compares favorably with the glass. The same trouble occasionally arises in the use of the *plain* aluminum ball that occurs at times when the glass is used, that is the ball after a time is extruded. The fact that this would sometimes happen led him to try the experiment of using a *frame* instead of a *ball.* It was hoped that in the healing process the frame would become filled with granulation tissue and a solid fleshy stump with an aluminum frame would be the result. These experiments were first carried out by using dogs as subjects and the results were fairly satisfactory, the failures, when they did occur, being due to infection which is sometimes very difficult to avoid when a dog is the patient. *Macroscopical* examination of these frames, after they had remained in place from six to ten weeks, showed them to be well filled with tissue which, later *microscopical* examinations proved to be mostly *new* connective tissue. The aluminum frames or balls have been used in his own practice, in human beings, twenty-one times and so far with no bad results except in one case, in which the ball was used after an enucleation. In this case the ball was extruded about a year after patient was discharged from the hospital. Nearly all of the twenty-one cases required an enucleation instead of an evisceration so that an implantation, after the manner of Dr. Fox, was done in the majority of them. After enucleation and implantation the healing process went on as well as in the ordinary case of enucleation and, so far, no after trouble has ever developed. The frame as used by him at present consists of a ball with a complete front and fenestrated side and back. The operation and after treatment are the same as where the glass ball is used. That the short time, the few experiments and the small number of cases, prove nothing is readily admitted, and yet the results seem good enough to warrant the belief that further use will demonstrate the fact that aluminum is the best material to use in these cases either in the shape of the complete ball or frame.

L. Webster Fox, of Philadelphia, Pa., failed to understand how in evisceration of the eyeball the firm tissue of the sclerotic can find its way into the interior of Bryant's fenestrated aluminum artificial vitreous bodies. In some cases, after enucleation, a cicatricial contraction of the mucous membrane of the eyelid and orbital tissues occurs and there is difficulty in adjusting an artificial eye. Here implantation is of great value. In his first case of implantation he made a horizontal incision, forced in the glass ball and stitched the wound. The movement was limited, but the patient was so pleased that he was encouraged to continue. Now, when forced to enucleate, he immediately passed in a glass or silver ball. Although this does not give as good a stump as the Mules operation, the movement is greater and a better fitting of the artificial eye may result. He encourages the members of the Section to try first the Mules operation and second the implantation. He now uses No. 1 silk for stitching the conjunctiva. The after-dressing is made by saturating a pad of cotton with 1.5000 bi-chlorid solution which is left on for forty-eight hours.

W. H. Wilder, of Chicago, Ill., asked Fox whether in any of the cases of Mules operation sympathetic ophthalmia or irritation ensued, because this is the most important question which arises in this connection.

Fox replied that he had not had any cases of sympathetic ophthalmia following Mules operation or implantation. In two cases he had done the Mules operation where there was evidence of sympathetic ophthalmia, consisting of ciliary injection, iritis, keratitis punctata and dimness of vision. It required a great deal of bravery to eviscerate in this case. In three days, however, all these symptoms of sympathetic irritation had disappeared and the vision was decidedly better. The patient, however, was likewise treated by mercury. In the other case the sympathetic symptoms were likewise relieved.

W. T. Montgomery, of Chicago, Ill., asked Fox what his preference was in implantation between glass and silver balls.

Fox replied he had no preference, and it was a question of individual expense, as the silver balls cost $1.75 and the glass balls 5 cents. It is almost impossible to break the glass balls. In one of his cases a boy's artificial eye was smashed by a cow's horn, but the ball did not break. Unless a bullet be shot into it, it would be practically impossible to break the glass ball in situ.

Harold Gifford, of Omaha, Neb., did not think that the distinctive feature of these balls had been sufficiently appreciated. The framework gives a hold for the sclerotic as it contracts.

D. C. Bryant, of Omaha, Neb., in closing the discussion said that most of his cases were workingmen, and during the last two years he has done the operation perhaps twenty times. The aluminum ball costs only four cents unpolished, and is lighter and stronger than the glass ball.

(*Wednesday, June 8th, 1898. Afternoon Session.*)

C. H. Williams of Boston, Mass., "*A New Perimeter.*" In testing the field of vision with a perimeter by daylight it is very difficult to get equal illumination of the test object in all parts of the field, and where a test with reduced illumination is required, as in the early stages of atrophic conditions where it is important to measure the fields for white and colors by a clear light and afterward by a reduced light, in order to determine the relative reduction in their extent, there is no way of making such a fixed amount of reduction in the light that the tests from one examination may be accurately compared with those from previous examinations. In order to overcome those difficulties, and to give a test that will be more reliable and can be more quickly made, he has arranged a perimeter to be used in a darkened room, with small incandescent lamps for the test and fixation objects.

On a Foerster perimeter, with a broad semicircular arc of hard rubber, a small lamp of one-candle power is placed at the central fixation point, and another similar lamp is arranged to move as desired from one end of the arc to the other ; in front of these lamps are pieces of ground glass and a small metal diaphragm, to limit the size or shape of the illuminated areas. London smoked or colored glass can be used to reduce the intensity of the light by fixed amounts or to give it a uniform color. The movement of the light on the arc is controlled by a small electric motor attached to the perimeter, so geared to the light carrier that even motion with the required speed is obtained, and this motion can be at once reversed at any point by changing the polarity of the armature by means of a switch in the examiner's hand. In this way the point where the test object becomes recognizable is easily found.

The charts on which the examinations are recorded, are prepared in block form, and are attached to a stage which is fixed to the back end of the axis of the perimeter, and moves to correspond to the movements of the arc. This stage has a movement similar to that of a microscope stage, and is so geared to the motor that the block of charts is moved (by a reduced amount) in the same direction as the movable test object on the arc. When the limit of the field of vision is found, a pencil attached to the vertical support of the perimeter by a hinge so that it strikes the paper in line with the axis of the instrument, is pressed against the paper, and marks on the chart the desired limit. By using pencils of different colors the limits of the color fields can be easily shown as found by the different colored glasses placed in front of the test lamp.

E. C. Ellett, of Memphis, Tenn., "*Some Severe Cases of Tobacco and Quinine Amblyopia.*" 1. A young man of 26, smoking from ten to twenty cigarets a day, and drinking freely of beer and whisky, became amblyopic in August, 1893. When examined in February, 1894, the vision was 6/CC in each eye, pupils normal, and atrophy of the papillo-macular bundles of nerve fibers in each eye. Perimetry was unsatisfactory on account of the nervous condition, due to chronic alcoholism. The patient did not undergo treatment.

2. A man of 28, seen in October, 1896, had been amblyopic since the preceding April. His vision was 20/CC in the right eye, and 3/CC in the left. Since 13 years old he had smoked cigarets, and since 21, cigars, using from twelve to fifteen of the latter in a day. He was a moderate user of beer. The pupils were normal, the papillo-macular bundle atrophied, and there was a relative central scotoma in each eye. Under mixed treatment and stopping his beer and cigars, the vision came to 15/XX in each eye within six months. The field of vision, for form and color, remained contracted. The writer calls attention to the youth of these patients, and the great, and in the last case, unequal reduction of vision.

3. Was a colored boy of 21, who was strumous since childhood, with enlarged, repeatedly suppurating, cervical glands. He was seen April 20, 1898, and vision had been failing for five weeks. He was a moderate smoker of cigarets. His vision was reduced to light perception, the pupils were normal, and the ophthalmoscopic picture was as in the preceding cases. Under liberal doses of iodids, the vision in the right eye became, by May 14th, 15/XX in the right eye, with contracted field and a sector-like defect for color down and out. The left eye did not improve, and the field, taken with candles, showed a relative central scotoma. The writer doubts the propriety of putting this case in the same category with the other two.

4. A man of 30 took, in November, 1894, 120 grains of quinin in twelve hours, in 10-grain doses. There was temporary deafness, lasting three hours, and four days later bilateral blindness, becoming complete. Light perception was lost for three months. Under iodids he slowly improved, and when the writer saw him in 1897 his vision was 5/CC in O. D. and 1/CC eccentrically in O. S. The visual field changed, finally in May, 1898, showing a relative ring in O. D. and a central scotoma (absolute) in O. S. The vision did not improve. The man had used large quantities

of tobacco (fifty to sixty cigarets a day) for several years, up to a year before his quinine blindness was brought on. The pupils in this case were dilated, but mobile, and the ophthalmoscopic picture that of white atrophy.

L. J. Lautenbach, of Philadelphia, Pa., "*Some Results in Cases of Tobacco Amblyopia*," employs the term "tobacco amblyopia" to express a bilateral retro-bulbar neuritis of the optic nerves with central color scotoma, followed later by an atrophy of the optic nerve occurring in one addicted to the excessive use of tobacco, and not, so far as known, using any other toxic agent to excess. He has never found a case in which the disease was confined to one side when both eyeballs were present, and from this fact he seems to draw the deduction that the primary effect of the tobacco is not on the axial fibers of the optic nerve, but on a central cerebral inhibiting center governing these axial fibers.

He presented six typical cases of tobacco amblyopia, fairly illustrating the cases treated by him during the past seventeen years. He selected them with a view of declaring his views on a few of the doubtful points in connection with this disease. One of his cases was that of a boy, aged 13 years, who had all the typical symptoms of tobacco amblyopia, and presented as well a tobacco heart and a tobacco cachexia. After appropriate treatment and the removal of tobacco the case improved. According to his observations, it is more prevalent among the young than has been commonly supposed. Another was that of a young man of 23 years, who had undergone two separate attacks of the disease. He thinks that cases of tobacco amblyopia, especially in the young, when attended with little or no loss of vision, are often overlooked; the physicians unconsciously curing such cases after having diagnosed them perhaps as an irritation-retinitis or some vascular disturbance. He narrates another case where the remote and accommodative vision was normal, and yet a few years later the man was totally blind from the tobacco atrophy. The oldest case he presented was 76 years old, the vision improving under treatment.

In his experience the amblyopia has always been occasioned by smoking, and he believes the effect to be induced not by the direct absorption of the alkaloid, but of the volatile products of combustion. He has never met with a case of the disease caused by chewing; in fact, one of the ways by which he accomplishes the more ready and comfortable cessation of the smoking is to allow these patients to chew tobacco, if they so desire. Two or three of his narrative cases were so treated, and yet the vision was entirely restored. He has never seen a case of tobacco amblyopia in which the poison was occasioned by snuffing it up the nose, or by handling either in the wet or dry state. His favorable results have been accomplished by absolute cessation of the smoking habit, the use of increasing doses of alteratives, especially of iodide of potassium, and the liberal use of strychnine; the free use of laxatives, of hot drinks, water, lemonade, and milk; frequent hot baths, especially nightly hot baths, the frequent use of hot, stimulating eye baths, and astringents, especially alum.

H. B. Young, of Burlington, Iowa,—"*Amblyopia from Auto-Intoxication,*"—reports six cases, seen during the past year. In degree these ranged from slight disturbance (in one case V., 20/L) to absolute blindness. All were accompanied by practically uniform intestinal disorder, or manifested by failure of appetite, irregular action of the bowels (constipation), and a peculiar foul odor of the breath. Vision returned slowly in all under the administration of calomel and improved sanitary environment. Ages range from 10 to 64 years; five males, one female.

F. C. Hotz, of Chicago, Ill., had never seen a case of quinin amblyopia, or one from any other cause than tobacco and alcohol. Cases were usually of the mixed form, both alcohol and tobacco being used to excess. Gradual loss of sight, slight ophthalmoscopic disk changes and sluggish pupils are the prominent clinical symptoms. As a rule patients do not come at an early stage; in one case that he had seen of a saloon-keeper, who was one of his own best customers, both as to wet stock and weeds, had good vision one morning and two hours later found it completely obscured, being unable to read his own handwriting written the morning of the same day; physical examination showed vision less than 22/C, positive scotomata and blurring of the edges of the optic disks. Drinking and smoking were stopped and iodide of potassium given, with result in a few months of vision 20/XX and disappearance of the scotomata. This case is exceptional, on account of the sudden loss of vision, as in toxic amblyopia it is usually gradual, although the patients may claim that it has been sudden, as they reckon the loss only from the moment when they fail to read.

Casey A. Wood, of Chicago, Ill. Horner in 1873 expressed the opinion that the chronic gastritis of alcohol amblyopia has as much to do with toxic amblyopia as the tobacco and alcohol in the system. Sachs, a short time ago, went even further, and stated that the retro-bulbar neuritis is caused by nicotine and alcohol compounds with the ptomains in the intestinal tract rather than by these drugs themselves. Such changes also occur as a result of mal-nutrition, as in diabetes. Tobacco does not set up changes in other parts, as it is claimed to do in the optic nerve. That form of atropy of the optic nerve which has been commonly placed among "unknown" causes, may in some instances be due to auto-intoxication. In a series of experiments made by him on dogs, amblyopia and blindness followed the hypodermic injection of certain human intestinal ptomains. He suggested that a certain class of cases of progressive optic nerve atrophy are the result of absorption from the intestinal tract.

Dudley S. Reynolds, of Louisville, Ky., believed that many cases of amblyopia are due to auto-intoxication. It is difficult to separate cases of tobacco amblyopia by any pathologic changes, by perimetry and the color test, from similar changes found in persons much given to the use of toxic drugs. The use of alcohol alone, as a beverage, is not so likely to produce amblyopia as the condition it brings on by way of disturbed functions. The inhibitory effects of alcohol upon the organs show that a part of the amblyopia is really due to auto-intoxication, because similar conditions are found in people with disturbed digestion, who do not use alcohol.

On first examination, the amblyopia may be very slight, with nearly normal findings, yet after two or three years the area of the affected optic nerve substance will be found to have extended; if symmetrically, there has been very little increase in the amblyopia, but if towards the temporal side of the disk, the amblyopia will be found to have increased. Tobacco produces a form of hyperplasia resulting in changes in the nerve structures not only in the optic nerve but elsewhere. Those who use tobacco in any form have disturbances of muscular co-ordination and are liable to insomnia. Tobacco heart is a recognized form of weak heart. Tea and coffee are not without effects upon the optic nerve especially when the habit is not attended by active exercise.

Leartus Connor, of Detroit, Mich., had seen a number of cases of pure tobacco amblyopia, one of which was singular in the respect that the man began to smoke as soon as he could walk, his father being an inveterate tobacco user, and the boy was taught to light his pipe and smoke it before the father received it. Tobacco was used constantly until failure of vision at 40 years of age occurred. The patient was very nervous, but otherwise in perfect health, and had never used any alcohol, tea or coffee. Characteristic evidences of disturbance of the optic nerves were apparent, the vision being in one eye 4/CC and in the other 2/CC. Cessation of tobacco restored the vision within six months to 20/XXX. He later met with financial difficulties and in a fit of despondency killed himself.

Connor had never seen a case of quinine amblyopia. Recently in a child of 12 years, who had used three or four cups of strong coffee three times a day, headaches and loss of vision in the right eye occurred; everything looked red and reversal of the position of objects was declared in the right eye. The ophthalmoscopic evidences were negative, stopping of coffee resulted in diminution of symptoms and return of normal vision. Tobacco had given him more trouble in disturbance of vision than all the other drugs used by humanity.

W. H. Wilder, of Chicago, Ill., did not believe that many of the so-called amblyopias are cases of auto-intoxication. Some of the reported cases present certain unique features, and it is difficult to dissociate the symptoms from hysterical manifestations. He has only seen one well-marked case of intoxication with quinin, which was in a southern woman, who had taken very large doses of this drug for malaria. The ill effects from use of tobacco was not all due to nicotin, but probably to ingestion of some other products of tobacco, possibly pyridin. It has been shown that collodin is a product of tobacco from cigars, whereas from the pipe pyridine is the main product and naturally we expect more of it to be ingested the shorter the pipe. It is a well known fact that more cases of tobacco amblyopia are seen in England than elsewhere, which is probably due to the fact that the Englishman usually smokes a short pipe and gets more pyridin.

The susceptibility of the individual is a factor, certain races, as the Cubans and Spaniards, are almost free from it. Certain qualities of tobacco produce more trouble than others. He does not believe an individual is liable to tobacco or alcoholic amblyopia unless the resisting power of the whole organism is lowered when an excess of either tobacco or alcohol is liable to bring on disturbances of digestion and to lower the general vitality and thus account for the appearance of sudden amblyopia.

D. C. Bryant, of Omaha, Neb., has for ten years observed a case that is very susceptible to quinin. Ten years ago the patient was suffering with malaria fever and had taken large doses of the drug, the visual field became markedly contracted and vision diminished.

C. R. Holmes, of Cincinnati, Ohio, had a case of quinin blindness and deafness produced by ingestion of a half pint of whiskey and quinin. There was intense hyperemia of the disk. The hearing returned but total optic atrophy resulted.

E. C. Ellett, of Memphis, Tenn., said that his former partner, Dr. Minor, had reported eight cases of tobacco and alcoholic amblyopia that underwent perfect recovery without stopping either smoking or chewing. He, however, did not think anybody had profited by this experience to permit such things in their treatment. In his own experience he had not seen a case occur under 20 years of age and had found only ten under 30, but Dr. Minor's cases were mainly in young subjects.

L. J. Lautenbach, of Philadelphia, Pa. There has been one case reported at 19 years; there is plenty of ground for the belief that other nerves than the optic nerves are affected by tobacco and alcohol. It is recognized that the withdrawal of tobacco in certain cases of deafness rapid improvement results. Certain heart cases are primarily due to inhibitory changes in the coronary arteries. We allow certain truths to be taught in our public schools regarding the arrest of growth, etc., produced by tobacco and alcohol. He predicted that ten years hence there would be a number of cases of amblyopia reported positively due to tea drinking, as Ceylon tea has begun to displace Chinese tea. He has seen cases attributable to Ceylon tea. He believed that the whole class of cases which had been here considered were due to changes primarily in the nerve or in the cerebral center.

H. B. Young, of Burlington, Ia., said that a differentiation should always be made between hysteric amblyopia and those of toxic causation. He believed that the recovery of his cases was largely due to the use of small doses of calomel kept up for a long time. The case of inverted image that Dr. Connor spoke of belongs to true hysteric amblyopia. He had seen a case of relapsing amblyopia from excessive tea drinking.

F. C. Hotz, of Chicago, Ill., " On the Use of Epithelial Flaps for Replacing the Lost Conjunctiva." For the repair of large defects of the ocular or palpebral conjunctiva. Hotz has for a number of years made use of Thiersch's skin grafts in preference to mucous membranes, because the proper preparation of mucous flaps was very laborious and the result often disappointing. The ideal aim of plastic operations, however, must be to replace lost tissue by tissue of the same histologic character; and, therefore, though the Thiersch grafts answer the purpose very well, the substitution of epidermis for epithelium must be regarded as a make-shift to be abandoned as soon as we find a way of cutting mucous grafts, which can easily and quickly be executed and makes their healing reasonably sure.

This problem has been solved by Gifford. In the December number of the OPHTHALMIC RECORD, 1897, he described his method of cutting with a razor flaps from the mucous membrane; they are cut so thin that only the epithelium and a very little of the subjacent tissue is removed; they correspond for mucous membranes to the Thiersch grafts for the skin.

After describing the proper execution of this method (see December RECORD) Hotz said: "Since reading Gifford's paper I have employed his epithelial grafts in all cases where formerly I should have used Thiersch's skin grafts. I have found the flaps could be cut very easily and accurately; their application offered no difficulty if only care was taken to keep track of the side which was to go down on the wound. The results were so satisfactory that I have no reason to regret of having substituted Gifford's method for my own."

For illustration, one case was reported in which after the removal of an epithelioma of the ocular conjunctiva an epithelial flap fifteen millimeters in length and five millimeters in width was grafted on the sclera round the nasal border of the cornea. On the second day the graft was firmly adherent; at the end of the first week the conjunctiva had closed up all around the graft. After four weeks the graft and the adjacent ocular conjunctiva were still very vascular, but since April this vascular injection has entirely disappeared, and it requires a very close scrutiny to find the dividing line between graft and ocular conjunctiva.

W. L. Dayton, of Lincoln, Neb., had recently used Hotz's method for very large pterygium, filling up a space of 5x8 mm. with a mucous graft from the lip. He had not used holocain or any local anesthetic for shaving the graft from the lip.

G. C. Savage, of Nashville, Tenn., thought that the best method of dealing with large pterygii is that of Hotz'. If skin be transplanted it remains skin, and is not converted into mucous membrane. In pterygium operations he makes a puncture and counter-puncture in the body of the pterygium not far from the cornea, and pulls off the corneal portion by traction forceps. A very small portion of mucous membrane from the lip will completely cover the wound. His experience from this method of procedure is very happy, and he thinks it should be resorted to in all cases because so many recur after other methods.

J. L. Thompson, of Indianapolis, Ind., asked how long cases had been observed after these operations.

F. C. Hotz, of Chicago, Ill., answered that the case reported was operated on in February, and had been seen two weeks before this meeting. This was not a pterygium case, but the same operation applies. He had seen cases treated with the Thiersch graft two years afterwards when the growths had not returned.

Harold Gifford, of Omaha, Neb., said that where a large flap is made it is better to use a stitch, to dissect up the conjunctiva so as to tuck the flap under the stitch above and below. In one case of pterygium which had recurred five or six times he had operated on three years before by this method. The eye does not look natural in every way, but the pterygium has not returned.

The nominating committee, Allport, Holmes and Würdemann, reported the choice of the committee for *President, Casey A. Wood, of Chicago, Ill.;* for *Secretary, C. H. Williams, of Boston, Mass.* The report was accepted and the gentlemen declared unanimously elected.

Wm. C. Bane, of Denver, Colo.—"*Regular Corneal Astigmatism is not always Congenital, neither is it Unchangeable*"—cites two cases illustrating this subject.

Case I. Illustrates the development of regular corneal astigmatism in young girl aged 10 years. History of asthenopia; general health; V. R. 6/VI, L. 6L/VI. Manifest esophoria 2°, no evidence of astigmatism. Examination under homatropin showed hypermetropia 1.00 D. Patient given + 0. 50 s. R. & L. Four and a half years after first examination patient returned with symptoms of asthenopia V. R. 6/IX, L. 6/XII. Hotz's astigmometer showed O. D.; 0. 50 D. astigmatism; axis, 180°. O. S.—0.75 D.; astigmatism, 180°. Under homatropin, patient accepted; 0.50 c. 180° each eye.

O. D.+0.75 s.⊂⊃—0.50 c. 180°=6/VI.
O. S.+0.75 s.⊂⊃—0.50 c. 180°=6/VI.

One year after prescribing these cylinders patient returned, when she reported eyes comfortable.

Case II. Illustrating a change in the astigmatism, eight years elapsing between the examinations. W. J., aged 24 years. Indistinctness of vision when reading and attacks of headache. V. R., 6/VIII, V. L. 6/VIII.

O. D.—0.50 c. 165°=6/VI.
O. S.—0.60 c. 15°=6/VI.
Under homatrapine, O. D.+0.50 s.⊂⊃—0.50 c. 160°=6/VI.
O. S.+0.50 s.⊂⊃—0.75 c. 10°=6/VI.

Eight years later patient returned; eyes had very recently begun to trouble him; vision less distinct; aching of eyes and pain in right temple. V. R. 6/X, V. L. 6/XX.

O. D.—1.00 160°=6/VI.
O. S.—2.00 180°=6/VI.
Under homatropin, O. D.+0.50—1.00 1600=6/VI.
O. S.+0.50—2.00 180°=6/VI.
Prescribed ....O. D.—0.75 c. 160°.
O. S.—1.75 c. 180°.

The change was increase in astigmatism in right eye 1.00 D., increase in left eye with change of 10° in the meridans.

To be Concluded in the September Number.

REVIEW.

"LA GREFFE D'ÉPONGES COMME RENFORCEMENT DU MOIGNON APRÈS L'ÉNUCLÉATION." (SPONGE GRAFTING FOR REINFORCEMENT OF THE STUMP AFTER ENUCLEATION.)

A. TROUSSEAU (*Annales D'Oculistique*, CXVIII, 1897, p. 417).

Alluding to the unsatisfactory base furnished by the usual stump, which causes sinking in of the artificial eye, and results in a deformity which may be very disadvantageous, especially to a woman, the author mentions the operations of Critchett, of Mules, and that of Bourgeois (who introduces a little ball of silk into the cavity left after ablation of the eye), only to point out their disadvantages, and states that after reading the article on "Sponge Grafting in the Orbit," by Belt, of Washington, he was induced to practice this with certain modifications which he proceeds to describe.

Regarding the results of Belt as inconclusive, he questioned whether the later elimination of bits of sponge, mentioned by that author, were not due to imperfect sterilization of the piece inserted into the cavity, and bent all his energies toward securing a thorough sterilization of the sponge to be used. His procedure was as follows: Pieces of fine sponge, about one cm. in diameter, were soaked in permanganate of potassium, then in bisulphite of sodium. They were then carefully washed in sterilized water, exposed for forty-eight hours to the vapors of formol, and again washed in sterilized water. Finally they were kept forty-eight hours in a solution of oxycyanide of mercury 0.20, to 1,000, before being squeezed out and shut up in a sterilized flask, from which they were extracted at the last moment with sterilized forceps, to be inserted into the cavity thoroughly, irrigated with cyanide of mercury. The operation was practiced by him in five cases, but of these only three could be followed up for a sufficiently long time, hence the author only considers these three cases.

Case 1.—Man; 35; operated on January 22, 1897; enucleation done in the usual way, followed by introduction into the cavity of a piece of sponge, above which the conjunctiva was sutured ("en bourse"—like a purse), with sterilized flat silk thread, passed far from the margins of the membrane to avoid hasty section of these margins and premature opening of the cavity. Immediately after the operation the stump was satisfactory in volume and appearance.

January 23d. Dressed; no secretion, lids normal, not irritated, œdmatous or ecchymotic, superior palpebral fissure, not more marked on the side of the enucleation, than on the sound side. On separating the lids no hyperemia of the conjunctiva, no reaction. Stump convex anteriorly, filled out the cavity, leaving the "culs de sac" of normal depth, mobile followed perfectly the movements of the sound eye.

January 26th. Still no reaction, conjunctiva normal.

February 3d. Sutures removed, lips of the conjunctiva separated for a small space, leaving an opening about as large as the head of a big pin, through which the intact sponge was visible.

February 6th. The orifice had enlarged to the size of an ellipse, whose greatest diameter was one cm., and whose lesser coat 5-6 mm- Small pieces of disintegrated sponge drawn out with forceps. Neither suppuration catarrh nor conjunctival hyperemia.

February 16th. The disintegration of the sponge had continued, and the stump had sunken in. Patient left the hospital.

Until the end of March the orifice remained open, and small portions of sponge continued to escape. A month later, the stump, though less voluminous than shortly after the operation, looked well, and had good motility. However, there was a certain amount of sinking in of the artificial eye, and the superior palpebral fissure was accentuated.

The end of the operation was not attained, but if the complete innocuity of sponge-grafting was proven by the absence of all reaction and of any suppuration, the length of time in healing is to be regretted. However, the author is inclined to blame, not the introduction of the foreign body, but imperfect suturing, or too early removal of the sutures.

The same causes of failure he thinks were operative in the case of a boy of seven and one-half, operated upon the same day, and whose case was quite analogous to the preceding.

Fifteen days later he operated on two patients, leaving the sutures in place until the 15th day, but he was unable to see these patients after removal of the sutures.

In one of them there was found a small aperture through which the sponge could be seen, and there was reason to fear a result similar to the former cases. In the other, four days after removal of the suture the stump offered the best appearance, and the author hoped for a success, but cannot affirm it, since the patient did not return again.

Belt having proposed to improve the procedure by suturing the recti in front of the cavity, the author tried this in his fifth case, operated upon in September, 1897, and sees reason to congratulate himself upon so doing, since in this case there has been obtained a "magnificent" and perfectly movable stump, with so far no sinking in, though the patient, a young girl, has worn an artificial eye for three weeks. The best result is hoped for, but of course cannot yet be affirmed absolutely.

The author seems to have spared no effort to secure perfect sterilization, which is, of course, of great importance, but is it not possible that the use of the cyanide of mercury solution in the socket and for the sponge may have retarded the formation of new tissue through the sponge?

In my first article calling attention to this method (See *Medical News*, June 27, 1896), I speak of irrigating the socket and rinsing the sponge with sterilized salt solution, and still believe that to be the best method, though the sponge should be previously sterilized by formalin, or other antiseptic. Though the technique of sponge-grafting for the support of the artificial eye is not yet perfect this method approaches the nearest ideal yet suggested for the prevention of the sunken orbit. With perfect sterilization, imperfect suturing seems now to be the only difficulty to be overcome, and that will probably be accomplished by suturing the recti as well as the conjunctiva, as suggested by me and carried out in M. Trousseau's last case. E. OLIVER BELT.

CORRESPONDENCE.

EDITORS OF THE OPHTHALMIC RECORD:

Dr. George H. Price, of Nashville, Tenn., appears in your July issue as claimant to the prior use of the Maddox rods in testing the position of the retinal meridians. Since he very clearly substantiates his claim, so far as I am concerned, I tend him such laurels as I may have grasped, and trust he may wear them securely and gloriously.

Very truly yours, EDWARD P. BREWER.

18 Washington street, Norwich, Conn.

NEWS ITEMS.

Personals and items of interest should be sent to
Dr. Frank Allport, 92 State St., Chicago.

WE UNDERSTAND that Dr. C. M. Robertson, of Davenport, has accepted the position of Surgeon in the Army.

DR. EDWARD JACKSON has removed from 1633 Locust St., Philadelphia, Pa., to the McPhee building, Denver, Colo.

HARVARD MEDICAL SCHOOL.—An endowment of $25,000 has just come to the school by the will of the late Dr. Henry W. Williams.—*N. Y. Med. Record.*

DR. S. C. AYRES has been elected professor of ophthalmology in the Medical College of Ohio, the medical department of the University of Cincinnati.

THE LOUISVILLE OPHTHALMOLOGICAL AND LARYNGOLOGICAL SOCIETY has been in existence about six months. Dr. T. C. Evans is president, and Dr. Adolph Pfingst, secretary.

THE following officers of the American Ophthalmological Society were elected for the ensuing year: President, Dr. W. F. Wadsworth; Vice-President, Dr. C. S. Bull; Secretary and Treasurer, Dr. S. B. St. John.

THE RECORD collection in aid of the Cork Hospitals has amounted to £3,350, of which £400 has been allotted to the Ear, Eye, and Throat Hospital by the Executive Committee.—*Archives of Ophthalmology.*

THE ULSTER EYE, EAR, AND THROAT HOSPITAL.—A new wing has recently been opened at this Hospital. The extension comprises eight new private wards, new day-rooms, a new operating-room, new bathrooms, etc.—*Archives of Ophthalmology.*

MEDICAL COLLEGE CONSOLIDATION.—It is announced that the Atlanta Medical College and the Southern Medical College have united to form the Atlanta College of Physicians and Surgeons. Dr. A. W. Calhoun is president and Dr. W. S. Kendrick, dean, of the new faculty.

THE ROYAL VICTORIA EYE AND EAR HOSPITAL, Dublin. Her Majesty the Queen, has been graciously pleased to direct that the institution recently formed under the Act of Parliament, which amalgamated St. Mark's Ophthalmic Hospital, Lincoln-place, and the National Eye and Ear Infirmary, Molesworth St., shall be called the Royal Victoria Eye and Ear Hospital, Dublin.—*Archives of Ophthalmology.*

THE MEDICAL DEPARTMENT of Niagara University has recently united with that of the University of Buffalo, and in this change Dr. Alvin A. Hubbell of Buffalo, becomes clinical Professor of Ophthalmology and Otology in the latter institution. Dr. Hubbell was for fifteen years Professor of Ophthalmology and Otology in the Niagara University, as well as secretary of its Medical Faculty during the same time.

THE HEIDELBERG OPHTHALMOLOGICAL SOCIETY will hold its annual session August 2nd to 6th inclusive. There are thirty-eight papers on the preliminary list, whose authors include such well-known names as Uhthoff, Schmidt-Rimpler, Landolt, Raehlmann, Groenouw, Michel, Leber, Sattler, Hess, Pflüger and many others. We would advise all German speaking Ophthalmologists abroad this summer to attend the meeting.

THE MEMPHIS *Lancet* made its debut on July 1st, under the efficient editorial direction of Dr. E. C. Ellett as editor-in-chief, and Drs. Maury, Taylor, Krauss, Goltman, Haynes, Rice and Veron as his associates. Memphis is destined to be a prominent medical center. It is ably represented in its medical profession and there is an ample field for the new venture in medical journalism.—*N. A. Practitioner.*

T. E. MURRELL, M. D., Professor of Ophthalmology in the Barnes Medical College of St. Louis, Mo., died June 26, at Denver, Colo., aged 48 years. Dr. Murrell was a graduate of the University of Maryland in 1873, and after two years of hospital work settled in Little Rock, Ark., where he established an excellent ophthalmic and aural practice, and won an enviable position in the profession. He was an active, scientific worker, contributing much to the Section on Ophthalmology of the American Medical Association. In 1890 he was elected Secretary of the Section, and three years later a Vice-President of the association. In 1894 he accepted the chair of Ophthalmology in the Barnes Medical College, and removed to St. Louis. Two years later, he was compelled by failing health to relinquish his work in that city, and since that time has resided at various points in the western states and territories. His death was due to pulmonary hemorrhage.—*Jour. Am. Med. Association.*

BLINDNESS IN SPAIN.—One of the principal impressions produced on those who attended the recent Hygienic Congress in Spain was the large number of blind persons, not only among the beggars, but in all circles, even at the general sessions of the Congress. Hirschberg states that there is not a single professor of ophthalmology in the country, nor is there a public institution for affections of the eyes, these being treated in the public hospitals or in small private institutions. "Owing to their blind fatalism they allow these diseases to reach a stage beyond all cure, with no effort to check it, except possibly praying to Saint Lucia." Camuset remarks that in 300 cases which he examined, there were only three or four that were caused by amaurosis; the rest proceeded from neglect during infancy or from granular inflammation. Six institutions have been founded, but their founders have retired or died and the institutions have lapsed. Hirschberg observes that he never saw so many shriveled eyeballs anywhere, not even in Egypt. The percentage of the blind is larger in the southern provinces. He mentions a street band of nine blind men and also that the custodian of the watch-tower at Cadiz, famous for its magnificent view, was almost totally blind. His only reply to Hirschberg's questions was: "One must be patient."—*Deutsche Med. Woch*, June 9.

DR. PANAS, the eminent professor of diseases of the eye, proposes to employ in his clinic at the Hôtel Dieu collyria of oleaginous solution instead of the aqueous solutions he has hitherto used. Professor Panas has found that after a certain time aqueous collyria become cloudy and precipitate cryptogamic productions. Moreover, in order to instill usefully these collyria into the eye by means of a dropper, it is necessary to open wide the lid, which it is difficult to do when there is photophobia with blepharospasm, especially in children.

Oily solutions possess the advantage of remaining aseptic when they are well prepared and are not irritating to the external membranes of the eye, as demonstrated by the work of Dr. Scrini, the pupil of Professor Panas. The most interesting collyria from a practical everyday standpoint are those of atropine, eserine, pilocarpine, and cocaine. As the salts of these alkaloids are only slightly soluble in oil, recourse is had to the bases, which are soluble, and of which solutions are made of one per cent. for atropine and eserine; of one or two hundred per cent. for pilocarpine; and of two per cent. for cocaine. Olive oil should be preferred in making them, first freed from fatty acids by washing in alcohol at 90° F., then sterilized by heat at 120° F. It is subsequently allowed to cool to 60° F., and the organic base is added, which dissolves therein completely. Collyria prepared in this way retain their transparency and sterility a very long time, during which they undergo no chemical decomposition, nor do they produce any alteration upon the epithelium of the cornea or conjunctiva. They should be applied on the extremity of a small glass blunted spatula, dipped in the liquid and passed along the palpebral slit slightly opened.—*N. Y. Med. Record.*

CORNEAL ULCERS.—Great benefit is promptly obtained from the following:

℞. Santonin, ¼ grain.
Calomel, 1 grain.
Sugar of milk, q. s.

giving one every hour, following the last fourth with a dose of castor oil.

After full operation of the remedy and restriction of diet to nourishing food, the disease rapidly disappears.—*Hansell* (*Philadelphia*) *Polyclin., March 26, 1898.*

HOLOCAIN AND COCAIN IN OPHTHALMIC PRACTICE.—Lagrange and Cosse (Recueil d' Ophthal., November, 1897) have used the hydrochlorate of holocain, in 1 per cent. solution, in fifty cases. They conclude as follows: (1) It is particularly efficacious when the conjunctiva is inflamed; (2) it is to be preferred in operations for strabismis, chalazion, pterygium, and the extraction of foreign bodies from the conjunctiva and cornea; subcutaneously or subconjunctivally, four to eight drops of the above solution may be used; (3) for iridectomy and cataract extraction a combination is recommended (holocain 0.05, cocain 0.10, water 10); (4) cocain in 2 or 3 per cent. solution is the anæsthetic to be preferred in operations in which it is desirable to lower the intraocular tension.

THE

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A MONTHLY REVIEW OF THE PROGRESS OF OPHTHALMOLOGY.

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ORIGINAL ARTICLES.

CORNEAL ULCERS, VARIETIES AND TREATMENT, WITH SPECIAL REFERENCE TO SUBCONJUNCTIVAL INJECTIONS.*

BY JOSEPH E. WILLETTS, M.D.

PITTSBURG, PA.

The subject of corneal ulcers is such a common one that it scarcely seems worthy of the consideration of this society, yet there are many interesting details in the differentiation of not only the varieties, but also the treatment, which are extremely important when we recognize the irreparable damage they are capable of rendering to the organs of vision. The distinctive differences in the character and appearances of corneal ulcers is pronounced. However, it is not the intention to enter into the characteristic details of the various forms, since it is the design of the paper to deal more especially with the present method of treatment by subconjunctival injection, and, for the sake of brevity and convenience, other forms of keratitis, such as: phlyctenular, punctata, onyx, etc., will be spoken of as in the same category.

All forms of corneal ulceration are dependent, more or less, on infection. Evidence has been collected which shows that the pneumococcus of Friedländer is capable of producing grave ulcerative conditions of the eye, and that the pneumococcus of Fränkell has been observed as the pathogenic micro-organism in cases of tenonitis, panophthalmitis, hypopyon keratitis, conjunctivitis, and probably in some forms of dacryocystitis.

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* **Read before the Pennsylvania State Medical Society at Lancaster, Pa.**

Nuel says that keratitis punctata and analogous forms are diseases of special microbes that are absolutely typical.

In the treatment of corneal ulcers, atropia is looked upon as almost a specific, when in reality it is only a preliminary step. It has no germicidal action, and has no bearing on the cure of the disease, excepting that of preparing the parts for reparative action. It paralyzes the accommodation, doing for the eye what a splint does for a fracture, puts the part in absolute rest, which is a recognized factor in the successful treatment of all disease. It relieves the local congestion, which, however, is a symptom only, and seems to me to have a special action on some varieties that is not applied to others. In phlyctenular keratitis, which is not dependent on micro-organisms, while atropia is not contra-indicated, it certainly is not indicated, and the patient may be spared the annoyance dependent on its use. This disease, principally one of childhood, is characterized by elevations of the corneal epithelium at the limbus, dependent on the congregation of leukocytes at the peripheral nerve endings. It is readily cured by the yellow oxide of suitable strength, together with supportive treatment, in those cases of scrofulous diathesis, or cachexia, from unhygienic surroundings. Analogous to this form is keratitis fasicularis, which, like the former, commences at the margin of the cornea, but this, unlike the former, invades the cornea, generally in a parallel line, dragging after it a leash of blood-vessels, the arrangement of which is pathogonomic of this affection. It yields readily to the same treatment. The serpiginous ulcers with hypopyon and other forms of corneal infection such as onyx, require a more radical and prolonged treatment, the benefits of the actual cautery in these infections are infinitely superior to any other method. I have never seen a single bad effect from its use, and have used it when the condition of the conjunctival sac would seem to contra-indicate it. It is decidedly preferable to the Sæmisch operation, which only relieves the tension at the expense of a new traumatism: the evacuation of the hypopyon being not essential, since its absorption is assured under proper treatment. The cautery at a red heat should be applied to the underlying edges of the ulcer, and in case of onyx, penetrate it deeply, experience having taught me that the floor of the ulcer will undergo resolution with a thorough cleansing, or slight curettement. The cautery is a direct, immediate stimulant, and destroys the microbic area with which it comes in contact, instead of creating a new condition favorable for infection, as the Sæmisch operation does. All of these cases need atropia, hot water and the systematic influence of mercury. The latter may be accomplished by any method consistent with scientific medicine. Lagrange and Formaget (1) have employed mercuric cyanid by subconjunctival injection in the treatment of panophthalmitis. Chavellereau (2,) in the treatment of vitreous opacities, and Dunn (3,) in hypopon keratitis. E. H. Bernst (4,) prefers mercuric cyanid to bichlorid, claiming for it a quicker and more complete absorption. He is in favor of the method. De Schwienitz, Baker, and Roy (5,) concur in his opinion, while Stirling, Reynolds, and Savage (6,) have had unfavorable experiences with this method. Fernandez (7,) reports encouraging results in the treatment of trachoma, by the subconjunctival injection of the permanganate of potassium. An injection of 1 per cent. solution of cocain is first given, followed in about twenty minutes by an injection of from one-half to one gramme of a one to one-thousand strength solution of permanganate of potassium. The eyes are washed daily with an antiseptic solution, and in about eight days (or after the swelling has subsided), the injection is repeated. Mellinger and Bossaline (8,) introduced India ink beneath the conjunctivæ of rabbits, and demonstrated beyond cavil that fluids so introduced follow the greater lymph channels and surround the entire globe. The amount of ink actually entering the eyeball being small in comparison to the amount injected. They believe that the fluids also connect with the supra-choroidal and intervaginal spaces of the optic nerve.

Abadie (9,) repeats his injunctions against bichlorid solutions, especially when iodoform is used contemporaneously in purulent ophthalmia, on account of its evil effects on the cornea. Gallezowski (10,) has abandoned the method, and Ray feels that he cannot depend on them exclusively.

The progress of medicine is not so much dependent on new discoveries as it is on the careful sifting of the evidence at hand and the elimination of its errors. Its gain has been one of principle at the expense of superstition, and to-day it is an exact science. The theory of subconjunctival injections must be an error, since it is incompatible with the first teachings of not only hyperdermatic medication, but all medicine. Mellinger and Bossalino's illustrated experiments, showing a section of an enucleated eye, in which India ink had been injected during life, and which shows the ink in the eye and surroundings, is interesting only because it shows the channels traversed, for it has no bearing on the efficacy of the method. That it was found in the eye and optic sheath should not occasion so much surprise, as its absence in these parts would, since we know that were it not an inert, insoluble product, it would be found in every organ of the body.

Hyperdermatic medication is too well established — too frequently used — and the effect too palpable to doubt its immediate penetration of every organ of the body. It was for this that it was adapted and adopted. Its earliest promoter, Ruppaner (11), makes no claim in his treatise for especial benefit of the tissues at the site of injection. On the contrary, he speaks of the possibility of abscess in that region. We know that there is a disturbance of the relation of the cellular tissues at this point; that the solution injected is an irritant; that the traumatism causes an increased leukocytosis, which are all favorable to the production of abscess even in a healthy tissue. Photophobia, lachrymation, congestion, and pain are the predominant symptoms in corneal ulcer. The congestion is in direct ratio to the virulency of the infection. If this be great, the congestion in all the orbital tissue is great. There is no clinical data, no evidence, no law in medicine, that teaches us to select an already congested area for the introduction of an irritant, thereby accentuating the conditions instead of benefiting them. Conclusions are:

(1) That the rationale of the treatment of corneal ulcers by subconjunctival injections is extremely questionable.

(2) That the results are no better than if the injection be given in another part of the body.

(3) That the eye not injected receives as much medication as the injected one.

(4) That it accentuates already abnormal existing conditions.

(5) That it adds a new traumatism to an old inflammation.

(6) That it has a tendency to promote suppuration, to say nothing of thrombi.

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THE DETECTION OF UNSUSPECTED CORNEAL CHANGES BY EXAMINATION WITH STRONG LENSES AND FOCAL ILLUMINATION.

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It is the object of this paper to point out that by the use of a magnifying lens combined with focal illumination anomalies of corneal transparency may be found in certain instances, in which such lesions are neither suggested by the history, nor revealed by any other mode of examination. The method employed is the familiar one of lateral illumination in the dark room; as a magnifier I use a Coddington or other strong lens-combination of about ½ to ¾-inch focus. A ¾-inch objective can be used, but it is not a convenient form. It is well to focus the image of the flame exactly upon the corneal surface. The turbidity of the normal cornea is resolved by this examination into a faintly granular appearance with scarcely discernible grain. I would ascribe this appearance to the corneal lymph-spaces, in which the corneal corpuscles are situated. For on examining a microscopic slide of gold or silver-stained corneal lamellæ with the lens used for clinical work the corpuscles are barely recognizable as minute grains.

It is evident on physical consideration that the normal turbidity of the cornea may be much exaggerated without being manifest on direct or ophthalmoscopic inspection. For if not circumscribed it would not show as a shadow in the ophthalmoscopic view, but would merely dim the contours visible in the fundus. On direct inspection a diffuse corneal cloudiness would not be detected unless sufficiently pronounced to make the pupil gray. If at the same time the lustre of the surface is normal, the exaggerated corneal turbidity can only be found on using lateral illumination. Even with this aid, I find it is difficult to decide whether we have normal or slightly exaggerated turbidity—unless the flame-image on the cornea or in its substance is viewed with a lens magnifying six or eight times, and permitting a close approach. If the flame-image be projected against the dark pupil it is not difficult to tell with the lens, whether the turbidity is normal or intensified, after some practice on normal eyes. The distinction is facilitated by the fact that the more turbid the cornea, the coarser appears its grain.

Yet a diffuse turbidity, which the observer cannot recognize with the ophthalmoscope may reduce vision appreciably, since the retina itself is much more sensitive to the blurring of images formed upon it, than is the observer who views the retinal image through the ophthalmoscope.

I can classify the unexpected changes revealed by this method under three heads.

1. After *extraction* of *senile cataract* I have found often very much increase of corneal turbidity, beginning at the wound cicatrix and extending — sometimes throughout the entire cornea — while in other instances it diminished to about the normal transparency in the corneal center. Although I had previously noticed this turbidity, I have examined for it more systematically and recorded it only in the last eight eyes that have presented themselves. This study has shown me that imperfect vision after cataract extraction may depend partly on the turbid condition of the cornea, even when it is not recognizable by any other method of examination. In these eight eyes increased turbidity was found five times, and in none of these was the sight quite as good as might be expected from the condition of the pupil. *Indeed there seemed to be some proportion between the visual deficiency and the degree of corneal cloudiness.* The corneal cloudiness was seen when the eyes were first examined within about one week after operation, and did not change during the four to six weeks of subsequent observation. I do not know whether it diminishes in favorable cases, but I have seen it in eyes operated several years previously. In none of these instances was any corneal cloudiness observable by other methods but lateral illumination. In this series there happened to be no striped keratitis, nor any other condition that could be called keratitis. None of the eyes were irritable at the time of last examination. No sublimate solution had been used for irrigation in the operations performed by myself.

Table showing the relation of corneal turpidity to acuity of sight after cataract extraction. (Fundus normal in all cases.) Table on next page.

2. A second instance of corneal turbidity revealed only by this method I have described at the meeting of the American Medical Association in 1898 (to be published in the Journal of the American Medical Association.) It was observed in patients complaining of asthenopic symptoms with, however, more burning or smarting, and a tendency to increased vascularity, than is usually found in connection with refractive errors. Moreover, glasses, although useful in almost all the instances,

Time Since Operation.	Form of Operation.	Condition of Pupil.	V. After Full Correction.	Condition of Cornea.
Mr. M. 7 years, operated by another surgeon.	Simple extraction, later on iridectomy for occluded pupil.	Clean central pupil, fringe of thickened capsule at periphery of pupil.	20/30	Normal.
Mrs. W. 6 weeks.	Peripheral extraction with iridectomy.	A single shred of gray capsule in black pupil.	20/40	Normal.
Mr. Bd. 8 months.	Simple extraction; secondary discission.	Very delicate capsule, with small central rent made by discission.	20/50	Slightly increased turbidity next to cicatrix, but about normal in centre.
Mr. Be. R. E. 2½ years	Extraction with iridectomy.	A few shreds of faintly grayish capsule in black pupil.	20/100	Decidedly increased turbidity.
L. E. 8 weeks.	Extraction with iridectomy.	About the same as in R. E.	20/70	Turbidity distinctly more than normal, but less marked than in R. E.
Mr. St. 4 weeks.	Extraction with iridectomy.	Puckered remnants of capsule, not grayish, scarcely visible with ophthalmoscope; large, clean, central rent.	20/150	Decidedly turbid, perhaps more than any other in this series.
Mrs. C. 3 weeks.	Extraction with iridectomy.	Black, central pupil; but fringe of thickened capsule at edge of pupil.	20/80	Cornea more turbid than in non-operated eye.
Mrs. E. 2½ years, operated by another.	Extraction with iridectomy.	Puckered, and slightly thickened capsule throughout pupil, but centre of pupil quite clear optically.	20/200	Uniformly increased turbidity, when compared with non-operated eye.

gave neither complete, nor absolutely prompt relief. The vision was in all these eyes a trifle below normal after the utmost optic correction, and it was noticeable how undecided the patients were in their answers during refractive tests. The objective appearances were unmistakable in two strictly one-sided instances, viz., slight ptosis from increased vascularity of the lid, distension of the scleral veins next to the retrotarsal folds, and distinctly increased corneal turbidity, with "coarser grain," as compared with the other side. In three other instances, in which the disease was not one-sided, but more pronounced in one eye than in the other, it was also easy to satisfy oneself as regards the presence of the objective symptoms. When the irritation involves both eyes alike, the diagnosis is more difficult. The congestive ptosis is so slight that it is only detected when one-sided, the slight scleral vascularity is not characteristic, and the corneal turbidity, if equal in both eyes, can be called morbid only in well defined instances. Still, the writer has seen at least six other patients within less than two years, who complained of irritative symptoms not wholly accounted for by refractive errors, and whom he would classify under this head. In three of them the corneal turbidity was pronounced enough to be morbid beyond question. In the three other cases the diagnosis might have been in doubt. Some of these patients had slight inflammatory thickening of the conjunctiva of the superior transition fold. In others it was absent. The condition of the cornea cannot be considered a keratitis, but rather as an irritative lesion of uncertain localization, with disturbance of the lymph currents in the cornea. Most of the patients improved both subjectively and objectively, under rest of the eyes, correction of the error present, and the inspersion of calomel.

3. I would finally call attention to a true inflammatory condition of the cornea, which might easily escape detection without this method. It must be well known that occasional small specks of infiltration in the cornea give rise to moderate irritation, but not to any visible ciliary injection. Of course as a rule, these infiltrates may be seen by the naked eye or readily with lateral illumination. Yet I can recall two instances in which very minute inflammatory infiltrates would have been overlooked had I not made use of the strongly magnifying lens with lateral illumination. For even after having recognized them it was very difficult for me to see them with any lens of lower power. Yet the importance of these miniature infiltrates, and the correctness of the diagnosis, was shown by the influence of treatment in removing the barely visible specks in the cornea as well as the irritation they had

caused. The most striking instance, however, of inflammatory lesion revealed only by this method is furnished by the following unique case:

Mrs. S., 22 years of age at the time, began complaining of intense lachrymation during her pregnancy in 1876. The tears flowed so freely that she could not use her eyes for work, though the evening brought some relief. There were no other eye symptoms. She called on various oculists in this city and New York, but obtained no relief, and not even a definite diagnosis. The ducts were found patent on probing. In December, 1881, she came to me, and I still possess her complete record. The watering had now persisted for five years with slight remissions. As the tears flowed freely into the nose, there could be no obstruction in the tear passages. The nose itself was normal, and there were no nasal symptoms. The eyes were pale, but became slightly bloodshot on continued examination. They appeared normal on inspection. The conjunctiva of the lids showed merely congestion. No anomaly was found ophthalmoscopically (direct image). Her sight was only 20/60, and she accepted no glasses. Under Homatropin the refraction was emmetropic, but as Homatropin did not paralyze the accommodation fully, she was placed under Atropia. But with complete cycloplegia she could only accept cyl.—0.5 axis 0 with uncertainty.

I considered the lachrymation as a reflex of unknown origin. I could not account for the low vision by the ophthalmoscopic findings. She staid under observation three months, being treated with Fowler's sol., quinine and other measures intended to act upon the nervous system. There were some variations in the intensity of the watering, but no positive effect could be ascribed to the treatment.

She returned again in 1898 with this history. In 1882 she was treated by a colleague in an adjoining city by applications to the conjunctiva of the lids and the nasal mucous membrane. She was much benefited—practically cured as she says—for about six years, but still was under the necessity of calling on her physician off and on during those six years. The inference that this was a case of reflex from the nose, cured by nasal therapeutics is not borne out by further inquiry. There have never been any nasal symptoms, and there are none now—such as discharge, transitory nasal obstruction or sneezing spells. The interior of the nose is perfectly normal and shows no scars of any cauterization. I am hence of the opinion, that whatever benefit was conferred upon her, was due to the conjunctival application, not because the lids were diseased, but on account of the influence of those remedies (presumably nitrate of silver) upon the cornea.

Within the last ten years the watering has again returned in spells lasting a number of weeks. At first occasional treatment by the same oculist gave some relief; later on, it was either not so satisfactory, or at least not sought so regularly. She has now had more or less continuous watering for many weeks.

On July 12, 1898, I found Mrs. S. in good health and complaining of nothing except the lachrymation. When the eyes water she is somewhat sensitive to light. This shows itself now by deep wrinkles in the forehead, the result of years of frowning. When the watering diminishes she can use her eyes fairly well, but is getting somewhat presbyopic (44 years). At present the watering is much worse on the right side. The conjunctiva shows an insignificant thickening at the upper fornix, otherwise there is only slight congestion and no catarrhal secretion. The sclera is pale, but on long exposure to light there follows a slight conjunctival blush. No ciliary injection. The ophthalmoscope detects no anomaly, even on focusing upon the cornea with a 10 D lens. Her vision is

R. E. 20/40, with 0.5 ax O or sph.—0.5 (?)=20/30 minus,
L. E. 20/25—no glass.

The clue to all symptoms was found on examining the cornea with the magnifying lens under focal illumination. The right cornea is studded with 12 to 15 well defined specks of sub-epithelial infiltration, which cannot be seen with certainty on using the ordinary lens of the ophthalmoscopic case (about 15 D) but are unmistakable when viewed with the Coddington. The cornea is besides decidedly more turbid than normal. The left cornea shows even more turbidity than the right, but I could only find two single white miniature infiltrates in its substance.

I must hence consider the lachrymation a reflex from the diseased cornea—the disease itself being a circumscribed superficial punctate keratitis of the mildest possible type with no ciliary injection, and yet of a duration of 22 years (though with intermissions). This view is confirmed by the course under treatment.

I ordered calomel inspersion twice daily. As the patient, however, attributed much of her former relief to the conjunctival treatment, I applied a 0.5 per cent. solution of nitrate of silver as a matter of policy, and not because there seemed any good indication for it. She returned, however, the next day decidedly benefited. This improvement, which continued thereafter, I cannot ascribe wholly to the calomel, of which I have never seen so prompt an influence in any form of corneal inflammation. I have observed in other instances of superficial corneal processes decided and prompt improvement on using nitrate of silver for conjunctival indications, and have been led to believe that the influence of the silver upon the cornea is a direct one in certain cases. In the present patient, moreover, the conjunctiva could not be called inflamed. Yet the improvement progressed under the daily application of 2 per cent. solution of silver nitrate to the transition fold. The "dots" in the right cornea became fainter and some disappeared, until on the eighth day a few new ones made their appearance. She noticed, too, more watering, and V tested that day was found barely more than 20/50. The left cornea showed no spots by this time, merely an increased turbidity. On the 15th day all watering had ceased. The spots in the right cornea are now unmistakably fainter, and not nearly so numerous, and the turbidity of the cornea is not much above the normal in either eye. As the conclusive test, however, I wish to emphasize her ability to read 20/20 positively with with either eye.

The case is reported only on account of its diagnostic interest. From a therapeutic point of view it is by no means conclusive, and a relapse may be expected with some certainty.

A CASE OF CONGENITAL NUCLEAR CATARACT.*

J. WINTER WAMSLEY, M.D.

OF PHILADELPHIA.

Opacities of the crystaline lens may occur during fœtal development, or what seems more peculiar, opacities from no apparent cause may develop shortly after birth, in cases where the eyeball and its structures appeared at first to have been perfect. A case of this nature came under my observation in April, 1897.

Wm. K., a boy 14 years of age; at birth no defect in sight was observed, but when about 6 years of age the parents noticed a change in the boys actions and in the movements of his head. He looked sideways, or with his head turned. The family physician, who attended at the birth, was consulted, and advised special attention. He also stated that he had noticed no defect in the eyes at the time of the birth. The parents were the first to notice the change then developing. The patient was taken to a hospital, where operation was advised, and treatment given; no operation was done, probably from the parents' neglect. From that time little was done to relieve the defective vision, the boy not being able to read or distinguish objects. His early schooling was necessarily neglected. He learned, as best he could, from hearing. Three years ago the boy was again taken to one of our eye dispensaries, and two operations were performed on the left eye within a period of three weeks. The patient evidently neglected to stay and complete treatment; the cataracts still remained the same as prior to the operations; there had been no visible absorption of the lens.

The following notes were made when the patient first consulted me for treatment: Horizontal nystagmus of about 2 mm., under ordinary conditions. The number of oscillations seemed to increase if the patient became nervous. No existing inflammation in either eye. Pupils reacted well to light, and light perception and projection were excellent; vision of both eyes about the same; could count fingers at a distance of one foot with difficulty. Homatropine was used to dilate the pupils. In the central and anterior portion of each lens was an opaque spot of about 2 mm.; the peripheral portion of the lens was perfectly clear, and both anterior capsules were transparent, excepting a small place in the left capsule, which had a cicatrix from the original needle operation. It is probable that a single needle operation had been done on both occasions. The opaque spot in the left eye was a little larger than that in the right eye, and also may have been caused by the operation. No portion of the lens matter had been absorbed as a result of the operations. The capsule had apparently healed quickly. The tear in the capsule was not large enough over the sight of the opacity, which being harder than the clear cortical portion, the aqueous fluid had had less solvent action upon it. With the ophthalmoscope a red reflex was readily seen in both eyes when the pupils were dilated, but not so when the pupils were in their normal state of action. No distinct view of the retina or its blood-vessels could be seen. The patient stated that he could see better at night than during the day, and also in a subdued light than in an intense light or average daylight. This fact was due to the dilation of the pupils, allowing the light to pass through the outer clear portion of the lens, thus enabling him to see his best. Under ordinary circumstances, when the pupils were contracted from light stimulus, the pupils closed around the central opacities, and consequently let in a smaller amount of light, none going through the nuclear portion of the lens. As well as could be ascertained, the family history was good; no specific, rheumatic, or nervous disorders in any member of the family. The patient has been healthy from infancy. In April I again advised operation, which was done on the 25th.

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* Read before the Philadelphia County Medical Society, February 23, 1898.

As a preliminary, mixed treatment was given one week previous to the operation; two days before it a mydriatic composed of atropin sulphate 2 grains to one fluid ounce of water, was instilled into the left eye three times daily, and on the day prior to the operation the patient had a hot bath and a saline laxative. Cocain, in 4 per cent. solution, was used for local anæsthesia, the eyelids were separated by an ophthalmostat, the pupils were well dilated, and the eyeball was held at the corneo-scleral margin by an assistant. Double discission was performed, two needles being used, and each needle passed in at opposite sides of the cornea. The points of the needles were made to meet in the center of the lens, and using the cornea as a fulcrum, the two handles of the needles were brought together. The lens was thus forced apart, splitting completely in half. Care must be taken in doing a discission, not to use too much pressure on the needles, as it would likely force the lens from its delicate peripheral attachment, and cause it to drop into the vitreous. Immediately upon the lens being broken the needles were withdrawn. The aqueous humor then came in contact with the free split edges of the lens. A small amount of aqueous fluid also escaped through the vent made by the needles.

The conjunctival sac was then irrigated, atropin instilled and a slight pressure bandage applied. In a few hours the bandage was removed, and as a precautionary measure to prevent any undue inflammatory action that might arise from the operation, cold compresses were used one hour at a time in every three hours. The atropia was continued, it being used every six hours for the first forty-eight hours. Twenty-four hours after the operation showed that the aqueous was taking effect on the lens substance by the cloudiness developing in the lens.

A little pericorneal injection followed and did not pass off entirely until the greater portion of the lens had been absorbed, nearly four months after. After the first few days the ice compresses were discontinued, but the instillations of atropin were continued for twice a day for over four months; no disagreeable effects were experienced from its continued use, such as dryness of the throat and irritation of the conjunctiva, which often occur from long and continued use of the drug; no pain was present at any time, only a little soreness within the few hours after operation. The patient was seen about once a week. A few days after the operation, when any developing complication was thought to be well out of danger, the patient was instructed to wear dark glasses and permitted to go out. About two months later, while absorption was going on, the nucleus or the central opaque spot separated from the larger remaining portion of the lens, and dropping forward into the anterior chamber, lay in the bottom and in front of the iris. It caused no irritation, and remained until the whole of the lens had been absorbed. Its slower solution was probably due to a calcareous or fibrous state. Nearly six months was required to dissolve the lens in its entirety. No extra needling was necessary, as the lens was well softened and absorption was going on as fast as nature would permit. On the 14th of October the posteror capsule was cut with Hunter's knife-needle; the capsule was opaque and tough; apparently it had acquired this condition from the original operation of splitting the lens and also from the swelling lens substance. The knife-needle was passed in through the lower and outer quadrant of the cornea, and the capsule thoroughly divided longitudinally with a sawing or cutting motion. Care was taken not to use too much traction on the capsule, or cause undue drawing upon the ciliary bodies—neglect of this endangers the good results of capsulotomies. The eyes were again bandaged for one or two days, it being removed occasionally for instillations of atropin; no reaction followed the operation, and the use of atropin was discontinued. The opening thus made in the capsule allowed the light to pass through to the fundus to the fovea centralis, which had long been in disuse. After the capsulotomy, the fundus was examined with the ophthalmoscope; the retina, nerve, blood vessels, and vitreous were perfectly normal; no trace whatever of a remaining fibro-vascular sheath to the lens.

The patient was refracted by retinoscopy, a plus 13 diopter glass being used. As soon as the glass was put on the patient was able to count fingers at two yards with accuracy, and also by looking directly at the object. Whereas, before the patient had to look sideways in order to get the best view possible, the light coming through the peripheral portion of the lens. The vision at the present time is 20–150. This amount of vision is far from normal, and better vision might be expected after all difficulties had been removed. The defficiency is readily explained by an amblyopic condition of the retina due to disuse. The patient was given glasses in the early part of November last, and since that time has been wearing them constantly, with continued improvement, the rays of light falling directly on the fovea. The nystagmus has greatly lessened in the number of oscillations of the eyeball, and a more pleasant and intelligent expression has developed. The remaining cataract in the right eye has not yet been operated upon, but operation will probably be begun in the near future. While the patient has gained distinct and direct vision from the operations, he will not be able to judge distance until he has the conjoint use of both his eyes.

The question arises as to the cause of the lenticular opacities in these peculiar cases. With the best possible history of the case from infancy, no indication whatever could be found that could, in reason, be the apparent cause of the cataracts. There had been no fœtal iritis, or, if it had occurred, it has left no trace of the disease either on the margin of the iris, or any mark on the anterior capsule over the sight of the opacity.

It seems to me that there might have been a tissue change from some condition of the lenticular nerve fibres, which in turn caused a degeneration of certain lens fibers. I see no reason why such a process could not cause such a change in the lens of the eye, in the same way as is often found in other tissues and portions of the body. These cases of congenital cataract give excellent results following operation, providing all the other structures of the eyeball are normal. The sooner the operation is done the better will be the result in gaining acute vision, by a stimulation and development of the central retinal cells and the wearing of proper glasses.

A REFLECTING TROPOMETER BASED ON TRIGONOMETRICAL MEASUREMENTS — PRELIMINARY COMMUNICATION.

BY F. B. EATON, M. D.
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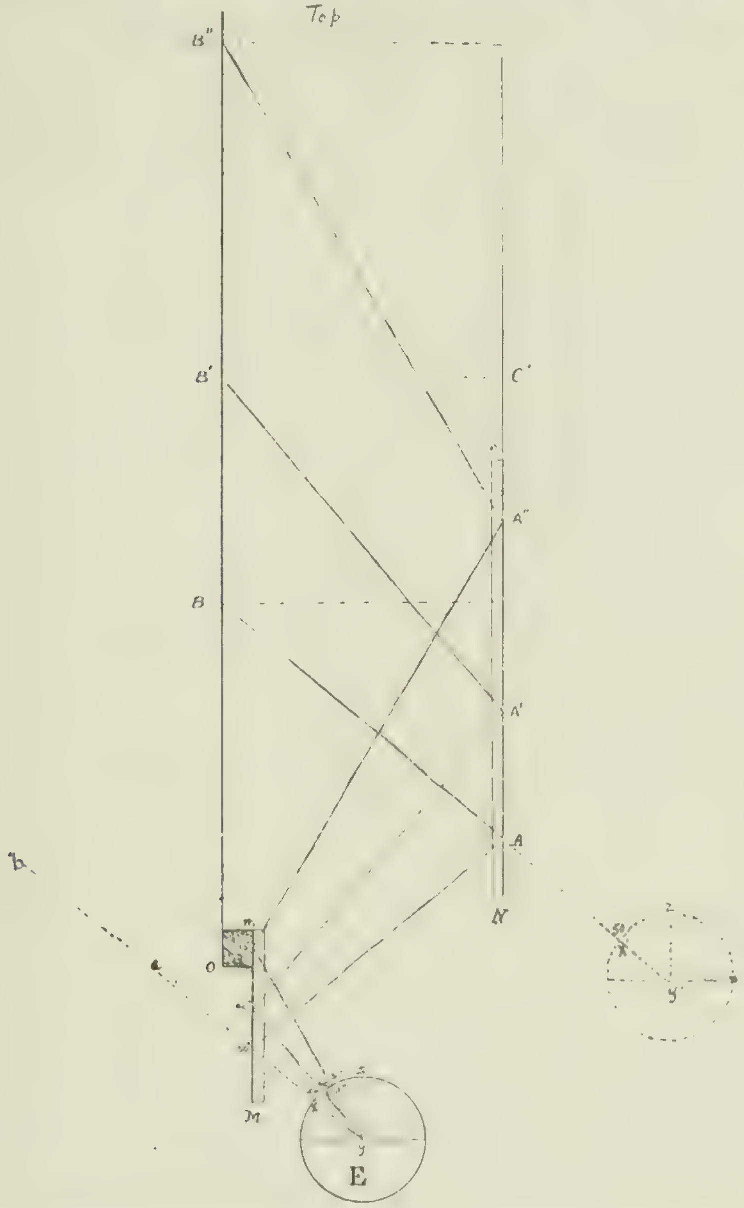
(Illustrated.)

Tropometry, although not new, has attained but lately a recognized position as one of the steps of an ophthalmic examination. Various methods and different forms of apparatus have been employed to estimate the field of monocular fixation, the most used being the perimeter, but of all forms the tropometer of Stevens best fulfills all the conditions. It can, however, only be used as an objective test, and this with all its advantages has some drawbacks, while a distinct limitation is its price. These considerations have led me to devise an apparatus, the essential features of which are alone illustrated in the cut. It is, as far as I know, original with myself, and after all is but the application of well-known principles of trigonometry. It can be used to test the rotations in any direction, either objectively or subjectively, and a model is now in continuous use in my office, having proved practical and useful.

In the cut E is (say) the right eye, the visual axis of which in the primary position is parallel (not necessarily co-incident), with the long axis of the instrument. M m and N n are mirrors placed exactly parallel to each other; B B″ is a test-scale carrying figures, syllables or letters, its surface also being exactly parallel to N n.

M m, N n, and B B″ are movable along the length of the instrument, and lines are ruled through the silvering of the mirrors at several points.

When in use to measure, say, the inward rotation of the right eye subjectively, the narrow proximal end of the mirror M m is placed so as to barely touch the inner canthus, and by means of spider lines the long axis of the instrument is adjusted parallel to the line of vision when the eye is in the primary position*. The patient is then told to look at the figures on the scale B B″ as seen in the mirror M m. The figure at B,



for instance, appears to the inner (left) side of the figure at B′. Suppose the farthest figure to the left which the eye can fix is at B; the mirror N n is then moved so that one of its bright lines is seen to cover the image of the point B; it will then be at A. To the patient the images of A and B will be seen projected in the direction of the dotted line y a b.

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*The usual means are employed to fix the head firmly.

We now have the right-angled triangle A C B, of which the sides B C and A C are readily measured, and as

$$\text{Tang. } A = \frac{BC}{AC}$$

by means of a table of natural tangents we can readily ascertain the value of the angle B A C. But B A C=x y z, which is the angle sought+.

Similarly in the triangles A' C' B' and A'' C'' B'' the angles B' A' C' and B'' A'' C'', respectively equal to the angles x y z and x y z, can be measured. As B C, B' C' and B'' C'' are constant every variation in the length of A C, A' C' and A'' C'' gives a certain angle. These having been tabulated and the table attached to the instrument, no calculation has to be made by the surgeon.

To measure the same rotation objectively, the surgeon has but to observe a point *X* (center of the pupil) on the eye-ball, by placing his eye at or near the point B. He then brings the bright line A on the mirror N n over the line on the mirror M m, by moving the mirrors, when he will see the points A and X in the direction A x' y', and can measure the angle B A C as before.

In order to avoid the blurring of the test figures when the test is made subjectively, the instrument is of such size as to make the actual distance from the eye to the test scale considerable, thus also adding to its accuracy.

The principal excellence of this apparatus, and its main advantage over other forms, lies in the ability to measure with it the actual rotation of the eye where otherwise the nose, brow or cheek obstructs the line of vision.

706 Sutter Street.

HOMONYMOUS TORSION—A POSITION OF THE RETINAL MERIDIANS HERETOFORE UNRECOGNIZED.

BY EDWARD P. BREWER, M.D., PH.D.,

NORWICH, CONN.

The study of the retinal meridians with my torsiometer [*Vide* OPHTHALMIC RECORD, May, 1898] has demonstrated great variability in their positions when the eyes are at rest and the point of regard infinity in a

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+In the drawing from which the cut was made BC=56mn, and AC=46mn. According to the above equation, therefore, Tang. A=1.19175 which is the tangent of 50°.

horizontal line. Among the cases in which the meridians were parallel there is a class, heretofore undescribed, which have an important bearing upon the study of the horopter and the normal position of the "apparent vertical meridians" of Hemholtz and the "longitudinal sections" of Hering, which I shall term the vertical meridians. Assuming the vertical meridians to be normally exactly vertical and parallel with the point of regard at a finite distance in the median plane, the vertical horopter consists of a cylinder perpendicular to the plane of the regard, whose section is a circle through the fixation point and the nodal points giving the horopter circle of Müller. Identical points of the retina are then correspondent and a unity of impression is produced. Such is the operative result of coördinating meridians and is the concomitant of binocular vision with unity of impression. This assumption demands simply that the image be received on identical points and a definite relationship of the meridians be maintained. It therefore appears possible for them to incline to the right or to the left without disturbing binocular vision, since the image will still be received upon identical retinal points. The horopter being practically unchanged at all points of fixation. The recognition of this simple truth has long been delayed, mainly through the dominants of the teachings of Hemholtz and his followers. Proceeding on these premises he constructed an horopter of convergence and mathematically demonstrated that the vertical horopter becomes a cone whose vertex is the point in which the axes of planes of the vertical meridians intersect and whose intersection of the visual plane is the circle of Müller.

By the aid of my torsiometer I have found a large number of cases showing homonymous declination of the vertical meridians both to the right and to the left. In a few the declination was considerable, amounting to several degrees; yet in all there was perfect coördination, a complete sense of location and an undisturbed unity of impression. This condition I have termed *homonymous torsion;* if the declination be upward and to the right it is *right homonymous torsion;* and if upward and to the left, *left homonymous torsion.* The following illustrative cases are, I believe, the first to be recorded:

CASE I. Mrs. O. W. aged 42. R. V.=$\frac{15}{40}$ with—1.25 D. cyl. ax. 45=$\frac{15}{15}$-L. V.=$\frac{15}{40}$ with—2 D. cyl. ax. 170°=$\frac{15}{15}$—Javal Ophthalmometer R. 1.50 ax. 120° L. 2 D. ax. 90° abduction 8°. Measurements in degrees of arc with Stevens' tropometer R. up 32°, down 55°, in 55°, out 55°. L. up 30°, down 60°, in 70°, out 60°. Torsiometer measurements indicating the torsional power. *Right vertical meridians+6° of arc left meridian vertical, right vertical meridian—2° of arc left meridian vertical. Left vertical meridian+7° of arc left meridian vertical. Left vertical meridian—2° of arc left meridian vertical.

The position of the vertical meridians when the eyes were disassociated by a prism and adjusted to a seemingly erect and a parallel position was upward and inward for the right eye and upward and outward for the left eye, each having a declination of six degrees. This condition of left homonymous torsion I express as follows: R. V. M.—6°⊃L. V. M.+6°. Repeated and control tests made as described in the articles before referred, gave uniform results.

Case II. H. O. L. aged 13. R. V.=$\frac{15}{15}$—with+0.25 D. cyl. ax. 90°=$\frac{15}{15}$ L. V.=$\frac{15}{15}$—with+0.25 D. cyl. ax. 90°=$\frac{15}{15}$+. Javal Ophthalmometer R. 0. 50 D. ax. 90° L. 0.50 D. ax. 90° Abduction 5° Sursumduction right 1° left 1° Exophoria 1½° at infinity. O. at occupation distance. Stevens' Tropometer R. up 30°, down 45°, in 50°, out 45°. L. up 30°, down 45°, in 50°, out 50°. Torsiometer R. V. M.+5° L. V. M.+4° R. V. M.—2° L. V. M.—3°. Left homonymous torsion of 4°. The vertical meridians giving the reading R. V. M.—4°⊃L. V. M.+4°.

Case III. S. C. aged 19. R. V.=$\frac{15}{50}$ with—1.50 D.⊃—0.50 D. cyl. ax. 90°=$\frac{15}{15}$ L. V.=$\frac{15}{50}$ with—1.50 D.⊃—0.25 D. cyl. ax. 90°=$\frac{15}{15}$. Javal Ophthalmometer R. 0.25 D. ax. 90° L. 0.50 D. ax. 90° Abduction 8° Sursumduction right 2° left 2° =Esophoria 2° at infinity. O. at occupation distance Tropometer R. up 35°, down 45°, in 60°, out 40°. L. up 33°, down 40°, in 50°, out 50°. Torsiometer R. V. M.+5° L. V. M.+5° R. V. M.—3° L. V. M.—3°. Left homonymous torsion of 3° R. V. M.—3°⊃L. V. M.+4°.

Case IV. Mrs. J. C. aged 37. R. V.=$\frac{15}{200}$ with+1.50 D. cyl. ax. 110°=$\frac{15}{40}$ L. V.=$\frac{15}{15}$ with+0.50 D. cyl. ax. 80°=$\frac{15}{15}$+. Javal Ophthalmometer. R. 4 D. ax. 110° L. 1 D. ax. 80°. Abduction 5° Tropometer R. up 30°, down 43°, in 50°, out 42°. L. up 30°, down 45°, in 50°, out 40°. Torsiometer R. V. M.+2° L. V. M.+2° R. V. M. —3° L. V. M.—4°. Left homonymous torsion of 1° R. V. M.—1°⊃L. V. M.+1°.

Case V. J. H. aged 35. R. V.=$\frac{15}{100}$ with—2 D. cyl ax. 180°=$\frac{15}{15}$ L. V.=$\frac{15}{200}$ with—2 D. cyl. ax. 180°=$\frac{15}{15}$. Abduction 6° Esophoria 2½° at infinity. Exophoria 3° at occupation distance. No hyperphoria. Tropometer R. up 30°, down 40°, in 45°, out 40°. L. up 28°, down 40°, in 45°, out 40°. Left homonymous torsion of 2° R. V. M.—2°⊃L. V. M.+2°.

Case VI. M. W. J. aged 44. R.=$\frac{15}{20}$ with+0.50 D.⊃+0.50 D. cyl. ax. 90°=$\frac{15}{15}$ L.=$\frac{15}{20}$+0.50 D.⊃+0.50 D. cyl. ax. 90°=$\frac{15}{15}$. Javal Ophthalmometer R. 0.75 D. ax. 100° L. 0.50 D. ax. 90° Abduction 8° Left hyperphoria 1½° Tropometer R. up 33°, down 47°, in 55°, out 50°. L. up 33°, down 43°, in 50°, out 50°. Torsiometer R. V. M.+7° L. V. M.+8° R. V. M.—0° L. V. M.—0°. Left homonymous torsion of 3° R. V. M.—3°⊃L. V. M.+3°.

Case VII. T. B. aged 53. R. V.=$\frac{15}{100}$ with+1.50 D.=$\frac{15}{15}$ L. V.=$\frac{15}{70}$ with+1 D.⊃+0.75 D cyl. ax. 90°=$\frac{15}{40}$. Javal Ophthalmometer R. 0.50 D. ax. 180 L. 0.75 D. ax. 180. Abduction 7°, Exophoria 1°, Right hyperphoria ½°. Tropometer R. up 30°, down 50°, in 50°, out 50°. L. up 30°, down 50°, in 50°, out 40°. R. V. M.+5° L. V.

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*Hereafter I shall designate the right or left vertical meridian as R. or L. V. M., as the case may be, the complementary meridian being always exactly vertical, unless otherwise stated.

M.+5° R. V. M.—5° L. V. M.—3° Left homonymous torsion of 2° R. V. M.—2° ⊃L. V. M.+2°.

Case VIII. J. D. aged 28. R. V.=$\frac{15}{70}$ with—2.75 D. cyl. ax. 165°=$\frac{15}{40}$ L. V.=$\frac{15}{70}$ with—3.50 D. cyl. ax. 10°=$\frac{15}{40}$. Javal Ophthalmometer R. 3 D. ax. 75° L. 4 D. ax. 100°. Abduction 8°, Exophoria 4°. Tropometer R. up 27°, down 45°, in 50°, out 40°. L. up 25°, down 45°, in 48°, out 40°. Torsiometer R. V. M.+3° L. V. M.+4° R. V. M. —3° L. V. M.—2° Left homonymous torsion of 4° R. V. M.—4°⊃L. V. M.+4°.

Case IX. E. A. T. aged 42. R. V.=$\frac{15}{60}$ with+2 D.=$\frac{15}{15}$ L. V.=$\frac{15}{70}$ with+1.50 D.⊃+1 D. cyl. ax. 70°=$\frac{15}{15}$ Esophoria 2° at infinity, the same at occupation distance. Javal Ophthalmometer R. 0.25 D. ax. 80° L. 1.25 D. ax. 70°. Abduction 8°. Tropometer R. up 32°, down 45°, in 55°, out 50°. L. up 32°, down 45°, in 60° out 50°. Torsiometer R.V. M.+2½° L. V. M.—5°=torsion R.V.M.—2½° L. V. M.—0°. Left homonymous torsion of 2½°, combined with a plus torsion of two degrees in the left eye. The formula expressing the condition and represents the position of meredians when disassociated is as follows: R. V. M.—2½°⊃L. V. M.+5°.

Case X. N. W. I. aged 48. R. V.=$\frac{15}{20}$ with+1 D.=$\frac{15}{15}$ L. V.=$\frac{15}{20}$ with+1 D.=$\frac{15}{15}$. Javal Ophthalmometer R. 0. L. 0.50 ax. 90°. Abduction 3°. Esophoria 3½° Left hyperphoria 1°. Tropometer R. up 32°, down 45°, in 50°, out 40°. L. up 33°, down 45°, in 50°, out 40°. Torsiometer R. V. M.+5° L. V. M.+5°=Torsion R. V. M.—3° L. V. M.—3°. Right homonymous torsion when the vertical meridians were disassociated: R. V. M.+2°⊃L. V. M.—2°

THE

OPHTHALMIC RECORD.

A MONTHLY REVIEW OF THE PROGRESS OF OPHTHALMOLOGY.

VOLUME VII. CHICAGO, SEPTEMBER, 1898. No. 9. NEW SERIES

EDITORIALS.

PATHOLOGY AND SURGERY vs. ETIOLOGY AND THERAPEUTICS.

For many years the American Ophthalmological Society has been giving less and less attention to refraction, and this year, by the "conspiracy of silence," killed it altogether. The program of 1898 was made up of thirty-seven papers, not one of which was upon eye-strain or errors of refraction. In this studied neglect the American Ophthalmological, however, differs but little from other societies, and especially the foreign ones. Sarcomas and other tumors, operations, trachoma—of these we hear without end—but of the infinitely subtle and thousand unsolved problems of nine-tenths of the daily office-work of the oculist scarcely or not at all a word! Why is this? Is it that we have all decided that " the passing of the reflex " is already passed? Are there no such things as eye-strain, reflex neuroses, headache, and so forth? Have we determined all the problems in connection with these things? Is our hullabaloo about the prescribing optician and his sins sincere if we scientifically ignore refraction? Are pathology and diagnosis everything and etiology and prevention nothing? The causes of the indifference and neglect are many and recondite, perhaps, but the facts are none the less greatly to our discredit.

In the first place we are permitting ourselves to drift with the *Zeitgeist*, born of self-interest, which is throttling medicine and exalting surgery. " So soon as the fashionable oculist can afford an assistant, he turns refraction over to him," we overheard recently, and we fear it is too true. Now surgery is the despair of medicine—i. e., so long as disease may be prevented or cured by strictly medical means, the surgeon should not be called in. But in the hunger for success, eclat, and money, we humor our deluded patients and consciences by talking and writing and busying ourselves with operations. They pay better, and make us more fame. All of which, so far as it is morbid and exaggerated, is neither the science nor the art of medicine.

Another reason is that pathology and ophthalmic surgery are fashionable, and require a comparatively low order of talent. It is a comparatively small thing to do the few operations of ophthalmic surgery, and a tyro can soon learn the trick, but it requires a fine nervous system, keen judgment, and inexhaustible patience to diagnose and treat a complicated case of eye-strain. It is easy and satisfying to make a thousand slides of a hundred diseased and dead organs. After they are made, however, do we always even draw the lessons and make them practical, which might be drawn from these dead tissues of a past disease that killed the forgotten patient? More than this can pathology always, nay, can she generally tell anything of the

> Old unhappy far-off things
> And battles long ago,

the habits and mal-functions that instituted the beginnings of the morbid process? It is, for instance, the conviction of many scientific-minded and careful men that eye-strain has a great deal to do with functional gastric troubles, with anemia, with the origin of cataract, glaucoma, etc.—but would "the visiting inhabitant from Mars" attending our medical gatherings or reviewing their reports suspect the fact? In a recent article in the *Philadelphia Medical Journal* the greatest living specialist in diseases of the stomach, in the paragraph epitomizing the subject of gastric neuroses, never even distantly alludes to their frequent reflex source in eye-strain. Yet articles attesting the frequency and directness of this casual nexus have been published by numerous oculists, and by general physicians of the most scientific and conservative characters.

Many other reasons might be adduced for the shameful neglect of refraction—which we treat as a naughty and dirty boy, we will neither mend nor commend, but whom we keep carefully out of sight of the aristocratic world of Science—with a big S. Not only is such "science" truly unscientific but it is inethical. We directly relieve ten times the suffering every day by refraction that we do by operations, and we prevent one hundred times this amount. In every town and village and farming community one-half the people are suffering from headaches, etc., and bringing on ocular diseases, and to the traveling "Professor," and the prescribing optician, they are consigned by our folly. They are learning the costly lesson that the Professor is a fraud, and they cannot afford to visit the city; so they continue to suffer and endure.

Doctor Robertson at the recent meeting of the British Medical Association spoke as follows:

> The increased acknowledgment, too, of the importance of our specialty by the profession and the public is exemplified by the very greatly increased numbers of the profession who devote their whole time and energies to the practice of ophthalmic surgery. Thus, forty years ago, in the whole of Scotland there were only two pure ophthalmic surgeons, one residing in Edinburgh and one in Glasgow, whereas now they abound in Edinburgh and Glasgow, while Aberdeen and Dundee also supply representatives. We cannot overlook one cause of this increase, which is the recognition of the prevalence of refractive errors and the necessity of consulting an oculist with regard to them. Thus, forty years ago, the set of test lenses employed by the ophthalmic surgeon was of the most imperfect and primitive character, and it was not at all unusual even for the oculist to recommend the patient to go to the opticians to be fitted with glasses, while the profession in general did not consider it necessary to send such cases to an oculist for advice. Cylindrical lenses were then practically unknown, only being constructed at great cost and with great difficulty to meet some very exceptional case of marked astigmatism, in which the nature of the error and its degree had been worked out by long and patient investigation on the part of the surgeon. The difference in these respects at the present time is patent to you all. With the advent of Donders (whose colleague and successor, Professor Snellen, we welcome among us to-day) a new era dawned, and refractive errors and their consequences rest on a satisfactory scientific basis, and constitute a very large proportion of the cases applying to the oculist for relief.

These are hopeful and encouraging words, coming from the president of a society devoting its entire time also to the consideration of other things than refraction and functional muscle-troubles. We smile, however, at the words "forty years ago," when we remember that two or three years ago the chief optician of London could not make a rimless or a cement bifocal lens, and said that he very rarely was ordered by the oculists to make a cylindrical lens, and, if so, almost never one below a diopter in strength.

REPORTS OF SOCIETIES.

AMERICAN OPHTHALMOLOGICAL SOCIETY.

ABSTRACT REPORT.

New London, July 20, 1898.

The meeting was presided over by Dr. Geo. C. Harlan, of Philadelphia.

Why the Proportion of Blind in the Country Is Greater than in Large Cities.—Dr. Lucien Howe, Buffalo.—" In the twenty-five largest cities of the United States the proportion of blind is, with two exceptions, smaller than in the states in which these cities are situated; or, taking all the cities of over fifty thousand inhabitants, together we find in them about 33 per cent. less blind than the average for the entire country.

"Second, when we examine the different factors in the production of blindness, whether congenital or acquired, or, under the latter class whether due to traumatism, general disease, or to local diseases, we find these factors are all practically the same, or are made equal, in city and country with one exception: namely, ophthalmia of infancy.

" Third, a rather extended inquiry concerning the habitual practice of physicians in country almshouses, in hospitals and elsewhere in the state of New York, indicates that more attention is given to guarding against ophthalmia of infancy in the cities than in the country.

" Fourth, this tendency to the habitual neglect, or habitual use of such prophylaxis tends to make a rapid difference in the distribution of the blind, estimated at possibly 14 to 1. It is at least the most apparent cause of this difference, and probably accounts for the greater part of it.

" Fifth, it follows from this apparently warrantable conclusion that if as great care were taken in general throughout the country as is given on the average in the cities to such prophylaxis the number of blind in the United States would be decreased in a single generation by some few thousands.

" While it is neither advisable nor possible to force by legislation any one method of preventive treatment upon physicians in private practice, it is the right and duty of the state to provide for children born in almshouses the best treatment thus far known, and to require for them the use of the silver nitrate solution, or of some other prophylaxis which may in the future prove to be equally efficacious."

Report of the Committee on Resolutions Relating to Purulent Ophthalmia of Infancy.

After a full consideration of all the information at hand, including a detailed study of statistics, etc., the committee reported in favor of adopting the following resolution:

"*Resolved*, That we approve of legislation which would result in the invariable use of this method in almshouses, or of any other equally safe and efficient method, whereby the loss of vision from this disease would be lessened."

The resolution was adopted.

Some Unusual Tumors of the Eye and Orbit.—Dr. C. S. Bull, New York: Doctor Bull reported one case of sarcoma which was supposed to be due to an injury of the eye received at some previous time, and a second case in which the microscopic examination showed the appearance of tubercles, but in which the clinical history of tuberculosis was negative.

Discussion.—Dr. H. Knapp: Doctor Knapp stated that these cases were rare, but that he had seen two cases where the origin of sarcoma from trauma was not problematic, but followed the injury at once.

Doctor Pooley reported a case in which a supposed sarcoma of the orbit had been removed, and later examination showed it to be a tuberculous tumor of the lachrymal gland. The patient was a strong healthy individual without any history of tuberculosis.

Osteoma of the Orbit, with Enophthalmus.—Dr. E. Fridenberg, New York: The two features of interest in this tumor were, first, the position of the tumor, which was located much more towards the temporal aspect of the orbit than usual, the mass of the osteoma being about at the center of the upper orbital margin, and, secondly, the position of the eye, which was crowded backward into the orbit and slightly downwards; in other words, there was enophthalmus instead of the customary exophthalmus. The tumor with the anterior wall of the sinus was chiseled away, and the patient made a good recovery, though the eye remains still slightly lower than its fellow. Vision of 22/100 was improved to 20/50 by the use of glasses; the Javal ophthalmometer showing the presence of 8D astigmatism, which was corrected by +4.Dc. ax. 90° ⊂⊃ —4.Dc. ax. 180°.

Abscess Involving the Frontal Sinus, with Destruction of the Vault of the Orbit and Depression of the Eyeball.—Dr. C. F. Clark, Columbus: This abscess seemed to occur as the result of traumatism, the patient having received a blow in the face about a year previously, and having suffered more or less continuously with headaches and other symptoms that might be attributed to abscess in the sinus. The bone had been eroded to such an extent that the brain cavity was invaded, and the depression of the eye was sufficient to produce a hyperphoria of the opposite side equal to 5½°. The patient did well after operation, but the wound has not thoroughly healed, probably because of the presence of some sequestra.

During the year before she came for treatment she would occasionally have attacks of pain, followed by discharge of mucus and pus from the nose and mouth, and she noticed that at such times the size of the swelling of the orbit diminished. Pressure over the swelling met with such firm resistance that it was at first suspected that the condition was produced by an osteo-sarcoma.

A Large Tumor of the Orbit (*Fibro-sarcoma*) *of Twenty-three Years' Standing—Removal.—Dr. F. M. Wilson, Bridgeport, Conn.;* Doctor Wilson exhibited this pathological specimen, which was of immense size, for an orbital tumor. The patient had the power of opening the lids, but could not close them over the tumor except by taking hold of the free border of the upper lid and pulling it out. The tumor had existed for a remarkably long time, and there were conflicting opinions as to the advisability of an operation. The operation seems so far to have been a success. Although the eye was so displaced that the cornea was 1¼ inches in front of the orbit, motility of the iris and some vision had been retained.

Doctor Pooley remarked that in New York a tumor seldom got the opportunity to grow to such a size. He had seen the case previously and advised operation.

A Case of Lipoma of the Orbit.—Dr. Emil Gruening, New York: Doctor Gruening referred to the very great rarity of lipomas of the orbit, and then reported his case, which occurred in a young man. It was a lobulated tumor about the size of a Lima bean, and microscopic examination showed nothing but fat cells. The author stated that most tumors of this class that had been heretofore reported were sub-conjunctival tumors.

Discussion.—Doctor Holden stated that the more we examine tumors of the orbit the more surprised are we at the great variety that occur there. He referred to one 1⅓ inches in length by ¾ of an inch in width, two-thirds of which was a purely lipoma, a small portion angioma and one end of it distinctly fibromatous, and said that the association of these three varieties was not uncommon.

Dr. H. Knapp reported a case parallel with Doctor Gruening's, in which the tumor was partially encapsulated, and was so large as to necessitate its removal in three sections at three different operations.

The Treatment of Entropion of the Lower Lid with Caustic Potash.—Dr. Samuel Theobold, Baltimore: "In applying this method the aim should be to produce an escar 3 to 4 mm. wide, parallel with the lid margin and extending the whole length of the tarsus. The action of the caustic should not be allowed to approach nearer the edge of the lid than 1½ to 2 mm. When the requisite effect has been produced the caustic action is checked by the application of vinegar diluted with an equal quantity of water, or a solution of acetic acid of about the same strength. The escar soon begins to contract, and the lid, which up to this time has been held in an everted position, no longer shows an inclination to turn in. It is seldom necessary to repeat the operation, but it can be done if necessary."

Doctor Theobald thought the treatment especially applicable to senile entropion, but useful also in other varieties. Better results, it was thought, could be obtained by the use of the caustic than by the knife, and no other anæsthesia is necessary than the local application, on cotton, of cocain.

Discussion.—Dr. Knapp: "I am thankful to Dr. Theobald for this paper, for senile entropion has vexed me considerably, and I have employed a number of operations, but without equal or satisfactory success. I think this method proposed is more thorough, and better adapted to the purpose than the actual cautery."

Dr. Abbott asked why soaking the lids with cocaine was considered preferable to its hypodermic use?

Dr. Theobald replied that he did not specially prefer it, but had not found the hypodermic necessary. He referred also to some cases in which other operations had been performed without success, and in which the caustic potash accomplished the desired result.

Dr. Gruening stated that he had found an operation similar to Hotz's method entirely satisfactory.

Dr. Noyes stated that he used a similar operation, but removed a narrow strip of skin, and inserted deep sutures into the orbital tissue.

Lymphoma of the Lids.—Dr. Myles Standish, Boston: Dr. Standish reported a lymphomatous growth in the lower lid close to, but not involving, the lachrymal sac. The administration of arsenic had resulted in its cure.

Dr. de Schweinitz referred to a number of lymphomas and sarcomas that had been favorably treated with preparations of arsenic, and stated that while we must not depend entirely upon the administration of arsenic in morbid growths, there are a sufficient number of cases improved by its use to show that we must be careful about operating simply upon the clinical diagnosis of these tumors.

A Case of Spindle-cell Sarcoma, Involving the Conjunctiva and Cornea; Removal of Growth without Impairment of Sight.—Dr. S. B. St. John, Hartford: The patient was a man 72 years of age, who had lost the right eye twelve years previously as the result of traumatism. The growth appeared upon the left eye, and grew in 2½ months from the size of a pin's head to that of a large pea. It sprang from the conjunctiva, was movable with that tissue, and overlapped the cornea. It was removed much after the fashion of a pterygium operation.

Conjunctival Melano-Sarcoma, Involving the Cornea.—Drs. John Green and A. E. Ewing, St. Louis: The tumor was a true melano-sarcoma, involving the tissues above named to such an extent, and was of such a size that it became necessary to enucleate the eye.

Hypopion Keratitis, Break in Descemet's Membrane; Preceding Perforation Fluorescine Passed Through the Ulcer into the Anterior Chamber.—Dr. John Green and Dr. A. E. Ewing, St. Louis: A case of traumatic ulcer of the cornea was reported, in which hypopion of 5 mm. in height occurred. The treatment which Dr. Ewing followed with good result was the free use of hydrogen peroxide, solution of normal strength, applied on a little mop to the surface of the ulcer, held there, and the application renewed a half a dozen times until cessation of the ebulition which takes place. On using this application bubbles of gas would appear in the anterior chamber, but this was rapidly absorbed, and in a few hours nothing remained of it. Fluorescine produced its characteristic reaction. The hydrogen peroxide seemed to have the effect of breaking up the hypopion mass, and producing the good results that occurred.

The conclusions are that one source of hypopion keratitis is through a direct break in Descemet's membrane, or by exudation from the iris, or thirdly, possibly from the epithelium of Descemet's membrane.

Discussion.—Doctor Holden opposed the idea that the hypopion could come from the cornea, and cited Elchnig's recent experiments to prove that just the reverse happened, and that the pus cells found in the cornea had gotten there secondarily. He believes that the break in Descemet's membrane always begins with the changes on its posterior surface.

A Case of Interstitial Keratitis Congenital in Origin.—Dr. H. F. Hansell, Philadelphia: The patient was first seen when only thirty-six hours old, and presented these symptoms: a thin watery discharge from the eyes, lids slightly swollen and bluish red in color, conjunctiva smooth, but the ocular portion distended from the fornix to the limbus of the cornea by an almost transparent effusion. The cornea showed on inspection a gray infiltration of the deep layers, consisting of fine points that tended to become confluent, most dense over the pupil, without vascularity or loss of epithelium. The child was poorly nourished, probably because of the fact that the mother, though ordinarily a healthy woman, had been in bad health throughout the pregnancy. There was no history of specific disease. The child was given tonic treatment, and at the end of six weeks there remained only a slight opacity of the right eye. The local treatment consisted of the application of mydriatics. A similar case is referred to, which was reported by Barnacheff, in which the cornea became entirely clear.

New Treatment of Ulcers and Other Infectious Diseases of the Eye by Cassareep.—Dr. S. D. Risley, Philadelphia: This preparation is made from the juice of the black cassava, was first introduced here by Dr. Chandler, and is used in a 10 per cent. ointment. It is applied freely between the lids, and the eye subjected to massage to distribute it, and in the corneal cases the protecting bandage applied. It causes no irritation and rapidly produces improvement.

Discussion.—Dr. John Green stated that he had seen the natives making cassava bread, and that among them the juice had the reputation of being preservative of flesh.

Dr. Myles Standish has been using the preparation since Dr. Chandler originally introduced it, and thought that in the case of corneal ulcers, if the ointment be used for some time after healing has occurred, the scar is less dense than if treated by other means.

Doctor Jack had used the preparation, but said that in some cases it had been rather irritating.

Doctor Risley stated that he had not noticed any difference in the degree of opacity as compared with other methods of treatment, but believed that that would depend rather upon the amount of tissue destroyed.

Spontaneous Expulsion of a Foreign Body from the Anterior Chamber.—Dr. J. P. Worrell, Terre Haute: The patient was a boy who had received an injury of the right eye while exploding a gun-cap by striking it with a hammer. After the inflammation had cleared up a small piece of bright metal could be seen on the inner surface of the cornea. The patient declined operation for its removal, and some days later appeared with the statement that "feeling something scratching the eye he rubbed it with a bit of cotton and removed, with some secretion, a small piece of bright copper." No inflammatory trouble followed.

Discussion.—Doctor Hansell reported a case where a piece of steel had been in the anterior chamber, according to the patient's story, fifteen years, and was spontaneously extruded.

Some of the Earlier Symptoms of Senile Cataract.—Dr. W. F. Mittendorf, New York: Doctor Mittendorf has carefully observed the last 508 cases of incipient senile cataract that have appeared in his practice in order to determine the exact location of the first changes in the transparency of the lens. Of these 106 were central and 402 peripheral, and of the latter the starting point of the striæ was found in the upper periphery in 13 cases only, in the outer periphery in 47, in the general periphery 48, and, the greatest number, 286 cases, in the lower and inner quadrant. Admitting that cataractous changes do not depend upon senility alone, but more particularly upon the nutrition of the lens, Dr. Mittendorf offers as a possible reason for the great prevalence of opacities in the lower inner quadrant the theory that there is a constant accommodation for small objects, especially reading by artificial light, requiring a more or less forced convergence and a downward look, during which the pressure upon the surrounding tissues is an impediment to the nutrition of this particular portion of the lens.

Discussion.—Dr. Risley thought that these opacities in the lower and inner periphery of the lens is often associated with chorioidal disturbances in that section. He had noticed it particularly among ironworkers, where it seemed to be due to the heat to which they are subjected, this being the least protected portion of the eye.

The Operations for Secondary Cataract.—Dr. H. Knapp, New York: Doctor Knapp reports a very interesting case of secondary cataract operation. The primary operation for removal of the cataract was without special interest. The capsule, becoming cloudy, and necessitating a secondary operation, it was needled in the ordinary way. The immediate result was good; but two days later reaction occurred, and a severe, acute glaucoma set in. An iridectomy was at once attempted; but it was found impossible to catch hold of the iris, so the operation was abandoned. The patient was relieved, however, of all pain and discomfort as a result of the paracentesis, and remained so for four days.

when trouble again set in. A second attempt at iridectomy was made, and this time successfully. The relief was permanent.

Dr. Knapp then gave a tabulated report of 70 cases of secondary cataract operated upon since October, 1897. Sight was improved in 63; remained the same in 6, and was almost lost in 1. Two cases besides the one quoted above were complicated by glaucoma, one of them being relieved by myotics, and the other by an iridectomy.

Considering the advisability of operating in cases that have vision not below 20/70, the author says that it must depend upon the case, but that ordinarily he believes we should attempt to give the patient the best sight his eye is capable of, especially as the secondary operation is, rare accidents excepted, safe.

He considers discission the proper operation, and lays down as a rule of paramount importance, "cut, don't tear." As the region of the wound made in the primary extraction is the weak point in these eyes, he considers it advisable to avoid that region as much as possible in the secondary operation, and a T-shaped incision in the capsule is thought to be best, the horizontal arm of the T being situated below the linear scar, which Dr. Knapp makes in the capsule when extracting.

Discussion.—Dr. Roosa advocated the plan of removing the capsule in the secondary operation, instead of doing a discission.

Dr. Noyes preferred the discission, and stated that he had occasionally introduced a long needle through the sclera because it gave a better leverage when cutting the capsule. Occasionally he had used a second needle passed through the cornea at the same time.

Dr. C. J. Kipp referred to the difficulties encountered in attempting to remove the capsule.

Dr. Callan stated that he found himself more and more inclined to the use of the De Wecker scissors.

Dr. Pooley thought that all the operations, other than discission with a sharp needle knife, were open to serious objections.

Dr. Knapp thought that discission is by far the safest operation, and is indicated in at least 95 per cent. of cases.

Delayed Union after Cataract Extraction.—Dr. Geo. C. Harlan, Philadelphia: Dr. Harlan reports two more cases of delayed union after cataract operations, in one of which union took place somewhere between the 10th and 17th days, and in the other at the end of 20 days. By a review of the literature he found 26 similar cases, in which the delay had lasted from 5 to 20 days. In 20 of these cases no cause could be given for the wounds having remained open. He states that such cases seem to require no special treatment other than atropia and slight pressure bandage, together with treatment of any complications that may arise.

Discussion.—Dr. Noyes had had such a case in a gentleman over 70, where the wound failed to unite for over a fortnight, the edges of the wound being actually inclined to eversion. The wound finally healed, and the man enjoyed good vision for ten years.

Dr. Gruening believed that one cause of the delay might be that the operation had been done within the clear cornea, and thinks that he gets most rapid healing when he makes the conjunctival flap.

Protargol in the Antiseptic Preparation of the Conjunctiva, Prior to Cutting Operations on the Eyeball.—Dr. B. E. Fryer, Kansas City: Doctor Fryer uses a 2 per cent. solution of protargol as an antiseptic, and finds it preferable to solutions of bichloride, etc. It is destructive of all organisms, and is not irritating.

Buphthalmia, an Interesting Series of Cases Occurring in the Same Family.—Dr. Walter B. Johnson, Paterson, N. J.: Three children in one family were found buphthalmic within the first few years of life. Ophthalmic examinations were not satisfactory. Two of the children were operated upon in Naples, and the third here by Doctor Johnson. In every case the progress of the disease was arrested. The mother's eyes were normal, but the father thought he had never seen out of one eye, in which a disintegrated calcareous lens prevented a fundus examination.

Discussion.—Doctor Harlan recalled the statement of Mauthner made some years ago that buphthalmia is simply congenital glaucoma.

A Contribution to the Pathology of the Eye and its Appendages.—Dr. G. E. de Schweinitz, Philadelphia: Case 1. Primary carcinoma of the Caruncle. A small growth entirely replacing the right caruncle, about the size of an ordinary pea, and which had existed for a number of years. Microscopic examination proved it to be carcinomatous. So far as known there has been no recurrence.

Case 2. Prelachrymal growth with the histological characters of tubercle. A small tumor anterior to the lachrymal sac was discovered while probing the tear duct. It was easily removed, and on examination showed the appearances of tubercle, although no tubercle bacilli could be found.

Case 3. Angioma of the lachrymal gland extending to the apex of the orbit; removal with preservation of the globe, functions of the eyeball, and of the external ocular muscles, with the exception of the levator, which was involved in the growth. This tumor, which is exceedingly rare, consisted of an angiomatous growth involving the lachrymal gland, and extended deep into the orbit. It was probably congenital. In front of the ear, on the same side, there was a small cavernous angioma about 1½ inches in length and 1 inch in width, but not communicating with the growth of the lid.

Discussion.—Doctor Fryer asked if, in the examination of the carcinoma, coxidia had been found.

Dr. de Schweinitz said that he believed that there was considerable mythology connected with the pathology of coxidia.

Doctor Bull reported a similar case of prelachrymal growth, which had been removed on the supposition that it was a cyst.

Remarks on Cases of High Myopia; Treatment of one Case by Removal of the Crystaline Lens.—Dr. H. D. Noyes, New York: "The interesting features of this case are, the early occurrence of converging squint—that a rapid development of myopia occurred between six and eight years of age—that the removal of the lens produced a change of 16D., and with it an improvement of vision to double the previous condition; that binocular vision was not secured by the refractive changes, and that diplopia was never observed."

Contribution to the Operative Treatment of High Myopia, with Report of an Additional Case.—Dr. W. H. Wilmer, Washington: In the case reported by Dr. Wilmer the operation decreased the myopia by 22.5D., and the vision was double what it had been before operating. In regard to the mode of operation the author preferred a slight discission, making a very small opening in the anterior capsule, followed by extraction within six days. As to the amount of myopia which offers the best operative result, he considers the ideal case to be the one wherein two or three diopters of myopia would remain after the operation. According to his experience this would mean a myopia of twenty-five diopters.

Discussion.—Doctor Noyes believed that if the operation were limited to cases of this degree the amount of chorioidal trouble would be so great as to incur great risks in the operation. He believes that we are justified in operating in young subjects with 13D. or more of myopia if the fundus is in good condition.

The Pathology of Experimental Quinine Amblyopia.—Dr. Ward A. Holden, New York: Doctor Holden's experiments were made with the aid of the newer stains for nerve tissues, and he exhibited drawings showing the changes that exist at various stages of the quinine poisoning.

The first changes were shown in the breaking down of the ganglionic cell bodies and a deposition of myoline-like substance in the nerve fibers. This appeared within three days after administration of toxic doses. From that time until the seventeenth day more ganglion cells were destroyed, and at that time changes in the optic nerve, consisting of a breaking down of the medullary sheaths of the fibers, was noticed.

By the forty-second day the ganglion cells and the nerve fiber layer had almost entirely disappeared, and the degeneration could be traced up to the external geniculate body and pulvinar. No signs of degeneration could be found elsewhere in the brain or cord.

Two Cases of Premature Delivery to Preserve Sight.—Dr. A. E. Adams, Newberg: Doctor Adams reports two cases of albuminuric neuroretinitis occurring in pregnant women, with vision reduced to a very low point. Shortly after premature delivery the vision showed marked improvement, and the author concludes that if abortion is ever justifiable it is in these cases, especially as the uremic condition of the blood is dangerous to the life of the fœtus as well as a menace to the mother.

Implantation of Sponge in the Orbit after Enucleation.—Dr. S. B. Risley, Philadelphia: "A fragment of surgeon's sponge, carefully sterilized, was pared down to a size just sufficient to fill loosely the cavity left by the removal of the ball, and to permit the suturing of the conjunctiva and the subconjunctival tissue over it without undue tension.

"The design was to furnish a framework for the deposition of connective tissue in the orbit, and thus avoid the concaved socket which follows enucleation, and always permits the accumulation of tears and mucus behind the artificial eye. After the operation the appearance was much the same as that presented after the insertion of a glass globe as in the Mule's operation. Two or three months is required to complete the process of absorption of the sponge and the deposition of new tissue."

Exhibition of Chalazion Forceps.—Dr. C. J. Kipp, Newark: These consisted of a simple forceps, one blade of which was solid, and the other contained a slit, so that when this blade is placed over the conjunctival surface of the chalazion the latter may be incised through the slit and its contents squeezed out by pressure.

A REPORT OF THE PROCEEDINGS OF THE SECTION ON OPHTHALMOLOGY OF THE AMERICAN MEDICAL ASSOCIATION.

FIFTY-FIRST ANNUAL MEETING, HELD AT DENVER, COLORADO, JUNE 7TH TO 11TH, 1898.

BY H. V. WÜRDEMANN, M.D.

MILWAUKEE, WIS.

(*Continued from August Number.*)

(*Continuation of Discussion on Changes in Refraction.*)

F. C. Hotz, of Chicago, Ill. The fact that eyes may change in a considerable number of cases should put us on our guard regarding remarks as to the fitting of glasses which patients may previously have worn. He notes that a large number of his own cases are subsequently fitted with different lenses. The trouble is that a great many patients go to some one else for the second examination, if at any time the glasses they are using become unsatisfactory. One of his cases had increased from —.75 cyl. in 1887 to —1.50 cyl. in 1897. In another case there was a change from emmetropia to a high degree of myopic astigmatism. In another case in 1893, —1. s. combined with +4. cyl. and in 1897 —2. s. combined with —5. cyl. He had found three cases in which hypermetropic astigmatism had increased, which is remarkable because statistics show that if the eye changes during school life the tendency is to develop myopic conditions.

G. C. Savage, of Nashville, Tenn., said that Bane should not have left out ophthalmometric measurements, as it was not yet settled where changes in refraction occurred. One of his patients, who had never been able to get away from him, was himself. He had found that his own myopic astigmatism had increased within nine years from —.50 cyl. to —2.25 cyl. in each eye. He thinks the radiating fibers of the ciliary muscle help to correct the astigmatism. These are not under the control of the third nerve, and it is impossible to reach them by mydriatics and to reveal them except by gradually changing the glasses as the astigmatism may increase.

H. V. Würdemann, of Milwaukee, Wis. One factor in the production or correction of astigmatism has not been dwelt upon, that is, the effect of lid pressure. Intense blepharospasm or chalazion produces a considerable amount of astigmatism, which, after cause has been relieved, passes away. There are some patients with astigmatism against the rule, who are in the habit of correcting it themselves, in whole or in part, by lid pressure. We may at the time of examination correct the total astigmatism, but when the patients are examined later on we find a recurrence, the elasticity of the cornea having asserted itself and instead of, for instance, as in a case recently observed, where there was on the first examination 2 diopters of corneal astigmatism; on a subsequent examination the amount was 3.50.

T. A. Grigg, of Butte, Mont., was of the opinion that if astigmatism was brought out by a subsequent examination it was latent and had not been fully corrected; it was there before and the mydriatic had not been used long enough or in sufficient quantity to overcome the defect. In young people the elasticity of the lens is great and eyes that have a considerable amount, which before using mydriatic could read 6/VI distinctly, afterwards could read less than half that amount. He was of the opinion that cocain might produce astigmatism as it acts upon the corneal epithelium, producing an irregular astigmatism. He agrees with Fox of Philadelphia that astigmatism is an invisible and subtle child of the devil whose hiding place is the ciliary muscle of the eye and is said to hate atropin as his father hates holy water.

J. E. Minney, of Topeka, Kas., believed that changes in the ocular refraction could take place, and had noted this difficulty ever since he began to practice ophthalmology.

J. L. Thompson, of Indianapolis, Ind., said that one cannot make methodical calculations for the human eye, and that he would not be surprised at anything that could there take place. He had cases examined years ago in which he had given plus cylinders, and when again examined found that these had changed from positive to negative astigmatism.

Edward Jackson, of Denver, Colo., had ten years ago reported a series of cases of increase of hypermetropic astigmatism to the American Ophthalmological Society, being interested at first by his own case, in which there was no question as to the refraction at different times; his eyes were measured repeatedly while experimenting with different mydriatics, there being no difference shown in the astigmatism, .50 D. in one eye and .75 D. in the other. After two or three years of hard eye work with the microscope, etc., he found that his glasses no longer fitted him, and examination showed that the astigmatism had increased 1.25 in each eye, two or three years later it showed 1.75 in one eye and 2.00 in the other, during the last eight years the amount of astigmatism has remained constant.

These changes in astigmatism may not depend upon any changes in the cornea, although the opthalmometer will show corneal changes in young people. Astigmatism against the rule is more apt to arise in middle life than it is earlier, and there are more cases after the age of 50 than before, which shows that these are dependent upon some change in the lens or its position.

H. B. Young, *of Burlington*, *Iowa*, showed that what is popularly known as second sight, *i. e.*, the refusal of glasses by people of 50 or 60 years of age who have previously used glasses, is due to the beginning of opacity in the periphery of the lens. All of these show a development of astigmatism against the rule. It is questionable whether the astigmatism following cataract extraction is purely due to the aphakia.

C. E. Norton, *of Lewiston*, *Me.*, described a case in which a compound error of refraction had been decidedly changed by pressure of chalazion, operation on the tumor restored the *status quo.*

In the opthalmometer we have an instrument of great accuracy for estimating the corneal astigmatism. He considers it a practical instrument for office work.

Henry Gradle, *of Chicago*, *Ill.*, quoted the case of a girl who had been examined in 1892, whose eyes showed a myopic astigmatism of 1.50 axis 180°. In 1897 he found the astigmatism increased to 4.50 with the rule, and with the best correction scarcely more than 20/XXX vision. He had seen two cases where astigmatism had been produced by the pressure of chalazion, and where the subjective findings changed completely within two weeks after the removal of the tumor.

Wm. C. Bane, *of Denver*, *Col.*, did not think that latent astigmatism theory was tenable. In the cases reported by the gentlemen, mydriatics had been used to an extent which would have brought it out if it were present.

The majority report of the Committee on the Condition of Eyes and Ears of Railway Employees was presented by Frank Allport of Chicago, Ill., and a minority report presented by C. F. Clark of Columbus, Ohio.

The reports were received and laid over until next year, the committee being continued.

After some discussion it was resolved, upon motion of Dr. C. H. Williams, to refer the matter back to the committee and to enlarge the committee by the addition of two new members.

It was further resolved that the report received from the above committee should be printed and distributed to members of the section in order that they might be able to present any other recommendations to the new Committee, and that their report shall come up for action at the next annual meeting.

The chair appointed as the two new members of the committee Drs. C. H. Williams and Dudley S. Reynolds.

Leartus Connor, of Detroit, Mich., "*Some Causes of Failure in Treating Diseases of the Lachrymal Apparatus.*" Grouped these under four heads, viz.: Constitutional disorders, eye strain, nasal disease, and faulty technique.

As the knife never cured a case of syphilis or rheumatism or rheumatic gout, it is impotent in cases of lachrymal obstruction due to these and allied diseases. That operator who forgets this fact is sure to see his most skillful technique come to naught, yet such failures are not infrequent.

That eye strain may cause lachrymal obstruction, is a matter of not infrequent observation, and the failures due to a neglect of this possible factor, have cast unmerited reproach upon the work of otherwise accomplished operators. The facts warrant its elimination from every case of epiphora.

As the lachrymal duct empties into the nose, it is a fact that intranasal disorders may obstruct the exit of the tears, at the mouth of the duct or by extension upwards along its walls.

As many ophthalmic surgeons, pay no attention to nasal diseases, they sometimes overlook accompanying nasal disease and so contribute to the failures in treating lachrymal obstruction. The condition of the nose should be examined in every case of epiphora, and all morbid conditions affecting the functions of the duct removed.

In the faulty technique attention was directed to six points:

1. The division of the canaliculus in such a manner that the opening was directed away from the eyeball and lachrymal lake, so that the tears could not reach the passage.

2. Failure sometimes followed the unnecessarily extensive division of the canaliculus, when a simple operation, as recommended by Prout, on the perpendicular portion of the canaliculus was ample.

3. For reasons mentioned, failures are less frequent when the upper canaliculus is selected and the lower left intact. The latter is larger and

better located for drainage, while the upper more readily admits probes and knives for operating on the duct strictures.

4. Undue violence, by destroying healthy tissues, making false passages, twisting and tearing the lining membranes, is responsible for many failures.

5. Timidity in using force adequate to properly dilate strictures is quite as bad as undue force. If accurate diagnosis be made and the size and direction of probe be correct much force can safely be employed; indeed only such force will prevent some failures.

6. Rigid ideas respecting the shapes and sizes of probes diminish the chances for success. The probe must be selected for the special canal and stricture, rather than the latter made to accommodate itself to the former.

G. Melville Black, of Denver, Colo., "*The Use of Large Probes in Strictures of the Lachrymal Duct.*" Under the above title no reference is made to mild cases of lachrymal disease wherein simple methods will effect a cure. Special attention is called to the necessity of not destroying the lower canaliculus. The canaliculus of the upper lid should be the one selected for slitting preparatory to passing probe. This canaliculus has less suction power, and is therefore best sacrificed. After the duct has been rendered patent, the lower canaliculus, still being intact, is able to effectually drain the palpebral aperture, whereas, were it destroyed, the upper canaliculus would not be able to prevent epiphora. The operation of slitting the canaliculus is performed with a Graefe cataract knife, with the aid of a Bowmans grooved director. A graduated probe is passed to explore the canal. If strictures are encountered, they are cut with an Agnew knife. It is found that it is rare that a No. 10 Theobold probe cannot be passed at the first sitting. Larger probes are passed from day to day until the largest size which the canal will admit is taken. It is usually possible to pass a No. 14 Theobold probe within the first few days. It is important that strong pressure be made on the swollen mucous membrane of the canal.

The use of the negative pole of a galvanic battery attached to the probe is found to assist in promoting absorption. Pledgets of lint cooled on a block of ice and soaked in lead and opium wash are recommended immediately after the primary operation. The eye and region of the lachrymal apparatus should be kept covered with these pledgets for the first forty-eight hours. After the passage of the probes, the canal should be syringed with a sat. sol. boric acid, and then 10 per cent sol. ichthyol. The probing should be carried out daily for ten days; then three times a week for two weeks; then according to indications until epiphora ceases.

A cure is usually accomplished in two months unless dead bone is present. Electrolysis should be practiced about once a week until its use is no longer indicated.

H. O. Reik, of Baltimore, Md., "*The Value of Large Probes in Strictures of Lachrymal Nasal Duct*," reported 130 cases of lachrymal stricture in which the large probe had been used up to and including No. 16 until the cases were pronounced cured. Thirty-eight of these cases had been under observation for periods varying from two to eight years, and only two had relapsed. The percentage of cures in cases which submit to a thorough treatment by the probe method is found, in the experience of Theobald and Reik, to be 95 per cent, and about 5 per cent of these may relapse.

C. R. Holmes, of Cincinnati, O., "*Extirpation of the Lachrymal Sac and Gland*," believes in conservative surgery, so long as milder means will accomplish the desired object. After reviewing extensively the literature on this subject, gives the following indications for the removal of the tear sac and gland:

1. In cases where it becomes necessary to operate upon the globe, as for cataract or glaucoma, especially so should there not be sufficient time to carry out other methods of treatment.

2. In patients who cannot devote the time, or who may be unable to endure the treatment by probing.

3. In all cases where conservative treatment has failed to cure within a reasonable time.

Epiphora is, in a large number of cases, due to an inflammation of the sac, resulting from an extension of the inflammatory process from the nose through the bony canal, and the retention of tears in a sac, so infected by the inflammatory process from the nose, forms an ideal place for decomposition and resulting inflammation, which may rapidly pass through the various grades of inflammatory changes, from slight catarrh to ulceration of the mucous membrane.

Operation and Technique: The administration of a general anesthetic is necessary and thorough asepsis imperative. The patient's hair, after being shampooed, is enveloped in a moist towel, a strip of gauze is packed firmly up under the inferior turbinal, over the exit of the canal, to prevent the blood from passing into the patient's larynx.

Extirpation of the Sac and Canal: The sac, if possible, should be hulled out as we would a cyst, without rupturing. In order to clearly outline the sac it is injected with a thick starch, warm and colored with iodin. The incision is made along a line which corresponds with the center of the membraneous portion of the sac and parallel with the muscular fibres of the orbicularis palpebrarum.

The upper portion of the sac rises to the upper edge of, or slightly above, the tendo-oculi. The skin and underlying tissue is carefully dissected through until the sac is exposed, the lips of the wound are held apart by three or four pronged retractors, and the sac shelled out of the lachrymal groove without tearing its coat or opening the vessels in the immediate neighborhood of the sac. The sac is dissected out from under the tendon ; in some cases it is necessary to cut the tendon or depend upon the curet.

The bony canal is next curetted, the wound cleansed by syringing, and closed by deep and superficial stitches ; if the tendo-oculi is severed, it must be replaced by heavy stitches. The canaliculi are split throughout their entire length, and the cut surfaces then cauterized with a flat platinum cautery point, to destroy all lining membrane and cause complete obliteration by granulation. Borated vaselin is placed on the wound, and a firm compress, to favor ready adhesion of its walls, is held in place by isinglass strips.

Extirpation of Lachrymal Gland: The incision is made along the margin of the orbit, cutting against the bone, beginning at center of upper orbital arch; it is carried to point 3 mm. below the outer canthus, the fascia or orbital septum is cut through along its attachment to the orbital margin, the good tissue is quite friable, and care must be taken in dissecting it out.

In some cases it will be advisable to remove a portion or all of the palpebral gland. The wound is not closed before all hemorrhage has ceased; it is then closed by two deep and three or four superficial fine silk sutures covered with sterilized borated vaselin, gauze and cotton, and pad fixed with strips of isinglass adhesive plaster.

Dudley S. Reynolds, of Louisville, Ky., had never seen lachrymal disease in a perfectly sound and healthy individual. He had serious objections to entering inflamed mucous-lined channels with probes, and utterly abhors the idea of the Theobald probe, 4mm. in diameter. A probe of that size can scarcely be passed through the bony passage of the Caucasian subject without doing damage, although it is possible to do so in the case of a negro. There is no cause of epiphora that cannot be discovered by careful examination, and if it be due to some destruction of infiltrated tissue arising from trouble in the nose, it should readily be found if sought for. He has heard a great deal about the innumerable cures of systematic probing, but he has never seen any. Carefully advised constitutional agents and the confining of local treatment to the diseased membrane of the nasal cavity results well. If by the use of Anel's syringe a 2 per cent. solution of sodium chlorid may be passed through the canal when no suppurative changes are present, this is a counter-indication for any surgical measures.

The cases described by Holmes belong to a special class. They are not only chronic cases, but people with constitutional taints, or who have been treated by harsh means and the canal destroyed. Primarily epiphora calls for no probing and the presence of the condition merely suggests abnormal conditions that exist in the nasal apparatus.

Casey A. Wood, of Chicago, Ill. Probing is sometimes proper and a cure may be looked for by this means. It is not always possible to discover whether probing has succeeded because patients become tired after a while of having their nasal ducts probed and cease to appear at the office of the surgeon. The patient often gets much relief at the outset; the epiphora is relieved, the symptoms disappear, the patient thinks he is cured and does not come back. In Chicago men and women seem to have very little time on their hands, and will not continue a treatment for weeks which is not only painful but tedious. He does not treat these cases for more than two or three weeks, an amount of time which a patient will usually give; uses as large probes as possible, teaches the patient to use the probe himself and allows him to use the treatment indefinitely at home.

Frank Allport, of Chicago, Ill. The reason why we do not get better results in these cases is because many are treated along stereotyped lines. It is objectionable to rip up the apparatus and pass in probes that are as large as can be possibly put in.

Eighty or ninety per cent of the cases of epiphora originate in the nose and should be treated primarily from that standpoint, which is practically ignored by most surgeons. He has learned to abhor and detest the large probes and has better results if the canal may be large enough to pass a No. 6; but if the physiological suction apparatus is destroyed, the tears will stand in the sac and not go down. He does not cut the punctum if he he can help it, but stretches it and divides the stricture in the duct by means of a hollow probe which contains a concealed knife. (Instrument exhibited.)

J. E. Minney, of Topeka, Kan. Every oculist must be more or less of a rhinologist. Personally he does not use any larger than Bowman No. 8 probe and has treated 250 cases.

George M. Gould, of Philadelphia, Pa. In a large number of cases the epiphora is somewhat due to excess of tears and not because the duct will not carry off the normal secretion. Eye strain is at the bottom of some of these cases. Long continued eye strain produces chronic conjunctival trouble with excess of tears. Where there is not an organic stricture astringent lotions may be massaged into the duct and the excess thereby cured.

J. L. Thompson, of Indianapolis, Ind., thought that some cases of epiphora were due to irritation from smoking, etc., which could be cured by stopping of the habit. He had noted himself that he did not ever have the result that the authors of new methods had in any form of treatment; he never promises the patients a cure of anything, and especially should this be done in lachrymal obstruction.

T. A. Grigg, of Butte, Mont. Laying aside those cases due to eye strain, slight catarrhal troubles and the like, and taking up those cases of pure organic obstruction, the first thing is to dilate the punctum and try to pass boracic acid solution through the duct by means of Anel's syringe. The nose is examined thoroughly, and if stricture is present in the duct is divided and from 6 to 8 Bowman probe is passed. In those cases which cannot remain for a time under treatment, he uses a canula about as large as a 6 or 8 Bowman probe and leaves it in place from three to nine months with very satisfactory results. There is a pathologic law that an intermittent pressure will produce hypertrophy and continued pressure will produce atrophy; a lachrymal canula produces pressure on all sides and causes an atrophic condition that relieves the obstruction. Where there is a purulent condition the canula may be omitted for a few days and the duct syringed with nitrat of silver. Some cases treated five years ago are cured to the present time.

J. O. McReynolds, of Dallas, Tex. The ultimate object to be accomplished in treatment of lachrymal obstruction is by no means to secure a sufficient large nasal duct, diligent attention to the condition of the conjunctiva and correct glasses should be given; antiseptic solution should be used locally.

R. F. Le Mond, of Denver, Colo., in many cases uses a hollow (?) probe of lead allowing the patient to wear it a month, washing out the canal two or three times a week.

E. C. Ellett, of Memphis, Tenn. Lead styles possess advantages over perforated canulæ, are more convenient, more easily fitted to the case and secure much better drainage than through the lumen of the canulæ.

L. Webster Fox, of Philadelphia, Pa. The treatment of lachrymal obstruction is the bane of ophthalmic surgery. He believes in large probes. He has found the use of the large Theobald probe and the lead styles, followed three or four days later by the use of the hollow canulæ devised by Bickerton of Liverpool and himself to be as satisfactory as any form of treatment. The canula is left in for six months, is taken out occasionally and the duct washed with a solution of boracic acid. Probing may have to be continued for years.

W. H. Wilder, of Chicago, Ill. It is an encouraging sign of the times to see so many men advocating conservative treatment of these cases. He predicted that in a few years indiscriminate probing of lachrymal cases will be relegated to the past. Many cases may be relieved completely if the conservative treatment be adopted in the beginning. Holmes' specimens illustrate very well the fact that in some the Theobald probe may be introduced, but in many of them such probes do great damage.

E. A. Kegley, of Cedar Rapids, Ia., teaches his patients to pass the probe themselves. He never goes above a No. 8 probe and thinks it is large enough to drain off the secretions. He has had 50 cases that he has been watching for eight years and every one of his patients is satisfied.

Leartus Connor, of Detroit, Mich. The earlier the case is seen the better the results. Probes should be used on the same general law that we use instruments anywhere. He has found that the large Theobald probe has particular success in cases where everything else failed. His conviction was that one of the forces by which the tears are discharged through the canal is the air going in and out over the end of the tube. He does not use the large probe if he can help and only when he is compelled to make a large opening in the sac.

It is necessary to make the patients understand that one passing of the probe will not cure them; if they will not take a long treatment, it is better not to have anything to do with the case.

G. Melville Black, of Denver, Colo., plead for conservatism in the treatment of simple stenosis, but in difficult cases and in purulency of the sac it was necessary to do radical treatment. Probes should be large enough to open the passage and produce pressure and other operative forces. In marked cases mild measures accomplish very little.

H. O. Reik, of Baltimore, Md., said that the 130 cases considered in his paper contained none of mild epiphora due to obstruction of the puncta, or reflex irritation or slight catarrhal troubles, but all belonged to that class in which there is organic obstruction in the duct; the cases were followed up for periods varying from one to eight years, and he knows of no other treatment for this class of cases except the use of large probes which will show 95 per cent. of cures. A 4 mm. probe can be introduced into the duct of the Caucasian subject. The plan of teaching the patient to use the probe himself has been made use of in many cases where the patient lives at a distance and cannot make frequent visits.

After the use of No. 8 to 10 probes the epiphora ceases in many of the cases and the patient is inclined to think it a cure; but unless the treatment be followed up, numerous relapses will be noticed.

H. Bert Ellis, of Los Angeles, Cal. "*Report of a Few Cases of Acute Glaucoma.*" I. G. M., aged 57, minister by occupation, January 8, 1895, while eating supper, a piece of dry toast choked him, and while coughing he felt something snap in his right eye. Soon afterwards his eye became painful, lids began to swell; solution of atropin and cocain was used by his physician; swelling and redness increased, pupil enlarged and tension slightly reduced; 1/2 per cent. solution eserin failed to contract pupil. Lens was dislocated downwards and backwards; under pressure bandage and rest the lens regained its normal position, but pupil remained large and irregular, lower part of lens cloudy, eye almost blind; two weeks later vision slightly improved, no pain, lids almost normal, injection diminished; vision left eye=3/XL+5.50s.⬭+.50c. 180° 6/VI and by addition of +3.00s. he could read number .50D.

February 1. Right lens cloudy; tension increased and cup glaucomatous; vision entirely gone; patient kept on eserin and refraction error corrected; nine months later lens clear, slight haziness of cornea, tension normal, disk cupped; six months after this he was suffering with some cold in the head, considerable pain in eye, and five days before reporting he had become almost blind; tension +3, pupil enlarged, media torbid. Iridectomy was done which gave him slight vision; —1.00s⬭ +5.00c., 125°=6/C.

2. Miss J. S. aged 24, Sept. 28, 1897 : Acute pain in right eye on day previous, followed by sudden blindness ; conjunctiva inflamed ; photophobia, tension increased, pupil dilated ; iridectomy done and on Nov. 4th, +2.75s.⬭+4.50c., 130°=6/XXIV. Dec. 8, 1897, —.75s.⬭+ 3.25c., 30°=6/XV.

Herbert Harlan, of Baltimore, Md., "*A Case of Hereditary Glaucoma.*" Reported a case of glaucoma, the patient being one of the fifth generation in which the disease had appeared. The case of a first cousin of this patient had been reported before the section in 1885. Both cases were successfully operated upon by iridectomy.

J. L. Thompson, of Indianapolis, Ind. Glaucoma may be a primary or secondary affection, and requires to be treated accordingly. When there are no complications, iridectomy is preferable to all other modes of treatment, but where there is great chemosis of the conjunctiva with iridochorioiditis or cyclitis, leeches and fomentations must precede the operation. He had one case of acute glaucoma which accompanied retinitis albuminurica. He has only seen hereditary glaucoma once, which occurred in a girl 11 years of age whose father had syphilis, the child having conjunctival disease. She had chronic glaucoma 6 months before he saw her, the optic disks being much cupped and veins pulsating; eserin was first used for several weeks, iridectomy was made later, which was followed by hemorrhages into the anterior chambers of both eyes, final recovery with vision 20/C in one eye and 20/LXX in the other occurred.

He had seen glaucoma and detachment of the retina in a man of 30, whose right eye had become blind suddenly in childhood, but which had given him no trouble until a few months before, when upon careful examination extensive detachment of the retina was found, this case was treated by eserin, but the outcome is not known.

The cause of the hardening of the globe is yet in doubt. Too much stress has been laid upon the obstruction of the iridic angle and spaces of Fontana. We have cases in which the anterior chamber has been unusually deep, and still the hardness of the eye ball has gone on increasing until sight was destroyed. He had seen one case of congenital absence of the iris and loss of the vision from glaucoma. Iridectomy is the most reliable remedy in a majority of cases, and yet in some chronic cases objections obtain for operative interference. In many of these the sight has been saved for years by eserin in weak solution and massage of the eye ball. Just how an iridectomy benefits a patient we know no more than we did when its illustrious author said : "No progress of importance has been made in respect to the theory of the operation, notwithstanding many attempts. Old hypotheses are usually dragged forth, little as they avail for the explanation of existing facts. The unhappiest of all, the one referring the effect simply to the wound of the ocular capsule, is periodically brought forth, decked in some new formula and recommended for adoption. Fortunately for our patients, practice advances independently on the foundation of empirical principles. No doubt some day a satisfactory theory will be found, but in the meantime we must not be led away by transient hypotheses."

George M. Gould, of Philadelphia, Pa., related a unique experience with a case of glaucoma in an old Quaker lady whom he had seen three years before; after having one eye operated on for glaucoma, the operation being a failure in that the iris was almost completely torn from its attachment, the pain has been lessened but the tension remains +2 until this day. At the time she visited him the other eye had become hard and she was much frightened and refused to consider an iridectomy on this eye or an enucleation of the bad eye; massage was instituted and she has now perfect vision in the eye last affected. The massage he used as often as the tension goes above normal, the rubbing must be very slow and clear around the outer edge of the eye, great pressure must be made but the movements must not be quick.

J. O. McReynolds, of Dallas, Tex., had seen one case which had been operated on for glaucoma by iridectomy two months previously, but the eye was lost, rendering an enucleation necessary. Repeated attacks of glaucoma occurred in the other eye, but were satisfactorily combatted by massage and repeated instillation of pilocarpin. He warned against the danger of making any kind of an operation upon the eye that is predisposed to glaucoma, as the cocain, the operation, or the mental impression produced upon the patient may have some influence in causing glaucoma. He described a case in which he had seen a patient who was completely blind in both eyes caused from glaucoma; he had lost one from glaucoma and following that, after several months, he had a pterygium removed from the good eye with the result two hours later of an acute, fulminating glaucoma, resulting in complete loss of vision.

J. E. Minney, of Topeka, Kan., had recently seen a case of glaucoma in which iridectomy was refused. The patient was treated by a homœpathic physician who gave five grains of quinin every four hours, curing the patient. He believed this was a case of malarial glaucoma. In one sad case the operation had been delayed until too late, the family physician treating the case by morphin on account of the pain; both eyes had ultimately to be enucleated. If those who teach medical students can only teach them to recognize iritis and glaucoma if nothing else, they will be amply repaid.

C. D. Wescott, of Chicago, Ill., asked if Gould or others who have used massage succeeded in preserving the visual field as well as in these cases. He referred to a patient who had been under treatment for two years by massage whose vision has remained 20/XXX and tension is kept down, but the field has gone on contracting.

G. M. Gould, of Philadelphia, Pa., replied that the field, in the several cases which he had, and especially the ones referred to, remains normal.

J. L. Thompson, of Indianapolis, Ind. Some of his patients treated by massage have gone blind, but so also have some of his iridectomy cases. A great many cases have been benefited by massage and the field has not been contracted; in spite of any treatment some patients will go blind.

G. C. Savage, of Nashville, Tenn. "*The Field of Fixation or Home of the Guiding Sensation,*" outlined a retinal space which he named as the home of the guiding sensation or the field of binocular fixation. He stated that any test of the ocular muscles is faulty if the image in the eye under test is not thrown entirely outside this field, while the image in the other eye is not displaced at all. He also stated that no phorometer had ever been invented that met these requirements, but that he had in his mind an instrument that would fully accomplish the purpose desired. He strongly emphasized the point that we must not only test the muscle balance, but we must also know what the duction power is in order to be able to do the best work for our patient. The balance test shows us what the heteropic condition is, and the duction test indicates to us what is best to be done in each individual case.

F. B. Tiffany, of Kansas City, Mo., "*Dynamics of the Extrinsic Ocular Muscles.*" His results are based upon the examination of 100 medical students. The examinations were always made with square prisms, and consisted in a careful search into the condition of the extrinsic muscles of the eye. He concludes that we have been in error as to the normal strength of these muscles; that the power has been placed much too high; that the text-books have been misleading, and that subsequent editions should be corrected.

G. C. Savage, of Nashville, Tenn., thought that Tiffany was in error in making a statement that the duction in his cases had been, perhaps, placed too high. He did not state the condition of muscle balance—how a case with no converging power at all, not showing strabismus, can exist and yet not be able to overcome a prism of any extent he does not know. He does not place much dependence upon adduction, as it is so variable; but this is not true concerning abduction, sursumduction or deorsumduction; he believes that 8° is the normal abduction and 3° is the normal sursumduction and deorsumduction.

J. O. McReynolds, of Dallas, Tex. The difference in results obtained by various observers depends much upon the kind of instrument they employ. Tiffany used square prisms in his tests, and this method is not as accurate as that by the phorometer; he uses a phorometer, in which the ordinary appliances of the Stevens phorometer, spirit level, etc., are combined, with two cells containing Risley prisms, so that any degree of prismatic effect may be obtained before any operation is made. We should now the full amount of muscle power and imbalance, as well as the constitutional condition of the patient.

B. A. Randall, of Philadelphia, Pa., protested against the acceptance of statistics in which so many emmetropic cases are shown, as this condition is almost an unknown quantity. Cases of insufficiency of the recti muscles are frequently resolved into cases of pure hypermetropia; the refraction should be corrected under mydriatics, and until that is done we cannot get true muscle balance.

Geo. M. Gould, of Philadelphia, Pa., commended Randolph's remarks and protested against the remark of Savage, that the question of adduction may be left out of the consideration, as the question of muscle imbalance resolves itself into the proportion between the abduction and adduction and the existence of symptoms. His rule is to correct all ametropia at first, and after that, if the symptoms do not disappear, it is time to work upon the muscles; he is able to relieve all symptoms and develop enough adduction power. He can do nothing with esophoria, and has never seen cases which have been benefited in any way; he has one patient to-day, a minister with 20° of esophoria, who works all day without difficulty when his ametropia is corrected.

J. L. Thompson, of Indianapolis, Ind., said that it was the rarest thing to find an emmetropic individual; he thought that the normal condition of the muscles for distance is 1 or 2 degrees of esophoria; he believes that this is the natural condition for man, as it is natural for the flexor tendons of the hands to be under some tension.

Dr. Sampson. This question is of a great deal of scientific interest, but to most of us who practice medicine the question is, what can we do for the patients? The methods for determining muscle balance are at fault. Speaking of the converging power, faulty adduction is certainly responsible for a great deal of trouble with which we have to deal. School teachers particularly, frequently have exophoria and a converging power not exceeding 10 degrees, while their work requires them to use these muscles, the majority show that other muscles of the body tire easily. An examination of the urine will show the salts run down to a low degree, and it is surprising to see the effects of prescribing quantities of water to be taken or looking after a condition of constipation, for as the general health improves the converging power of the muscles increases.

F. B. Tiffany, of Kansas City, Mo., said that the object of his paper was not to discuss the conditions of heterophoria, but to establish the normal relation of the muscles, and the results of his work correspond with those of Bannister.

C. H. Beard, of Chicago, Ill., “*Recent Experience with Advancement of the Recti Muscles*,”—has tabulated all cases of strabismus occurring in his private practice during the past six years. The total number of strabic cases is 214, or about 4 per cent. of all patients. Paralytic and latent strabismus are excluded. A brief summary of the table is as follows:

142 cases were of the convergent variety.
70 “ “ “ “ divergent “
2 “ “ “ “ mixed “

Six of the divergent were secondary to tenotomy of interni made to correct convergent strabismus.

Of the 142 cases of convergent strabismus in 74 the left was the squinting eye, 17 alternated and in 51 the right eye turned; in 18 the squint was intermittent when first seen; of the 70 cases of divergent strabismus in 29 the left was the squinting eye, in 26 it was the right and 15 alternated; 10 of them were intermittent.

As to the refraction of the 142 cases of convergent strabismus: Both eyes were hyperopic in 114; both eyes myopic in 6. Anisometropia was present in 2, emmetropia (or practically that) in 20. In the 70 cases of divergence there was hyperopia in both eyes in 38, myopia in both eyes in 16, emmetropia (practically) in both eyes in 11, mixed 2, anisometropia in 3.

In the 114 cases of convergence with hyperopia the latter was three or more diopters in 63. Of the 6 cases of convergence with myopia the error was three or more diopters in 4. Of the 38 cases of divergence with hyperopia, the latter was three or more diopters in 9. Of the 16 cases of divergence with myopia this was three or more diopters in 8. Of the 214 strabic patients 78 were under 15 years, 101 between 15 and 30 and 35 were over 30. There were 125 females and 85 males. Of the total number of cases 158 received some measure of treatment. In many this began and ended with the fitting of a pair of glasses; 56 were not treated, coming merely for examination and consultation. Among the 158 cases treated in some measure 70 had advancement of one or both muscles, the second muscle having been brought forward in about 12 per cent. of the operated cases. The operation was for convergent strabismus in 50 cases and for divergent in 20, in other words, of 81 advancements 57 were of the external rectus and 24 of the internus. Only three of the operations were made in cases of alternating strabismus; of the 70 operated cases just one-half had high degree of amblyopia in the squinting eye with fair to good vision in the fixing eye. Of the rest 13 had 20/XX in both eyes, 13 had 20/XXX in the better eye, and ranged from 20/L to 20/XXX in the worse—this is the corrected vision; in two the sight was not determined. The vast majority of the patients who had advancement were between 15 and 30 years of age—the years during which good looks are felt to be a necessity.

In thirty-two of the cases treated the strabismus yielded to atropin and glasses, and in nine others to these measures together with persistent systematic orthopic training by means of prisms, the stereoscope, etc. The corrected visual acuity of the forty-one cases corrected by other than surgical means amounted to 20/XX for both eyes in eighteen instances, to 20/XXX in both eyes in fifteen, to 20/L in one, and in three it was not ascertained.

Thus out of the 158 cases to receive some sort of treatment, a cure was accomplished in 111, leaving 47 which are either reporting from time to time, or have wandered off.

J. O. McReynolds, of Dallas, Texas,—"*Additional Notes on Employment of Absorbable Sutures in the Operation of Looping the Tendons of Ocular Muscles.*" The kind of suture material and method employed should vary according to the amount of correction desired. Catgut being used for different forms of heterophoria of moderate degree, the heterophoria being over-corrected to allow for relaxation of the sutures and stretching of newly found adhesions.

Kangaroo tendon being used for extreme heterophoria and in heterotropia because it is not absorbed for two or three weeks; an amount of over-correction proportionate to the tension placed upon the sutures being secured. For small degrees of heterophoria, the conjunctival capsule of Tenon and ocular tendon are grasped firmly with broad fixation forceps, so as to produce a vertical loop of the ocular tendon, and the loop fixed by a single suture passing through it horizontally.

In high degrees of heterophoria and moderate degrees of heterotropia an incision is made along the border of the tendon, and with strabismus hooks the tendon lifted from the sclera, one end of the suture is then introduced beneath the tendon, close in the scleral attachment, the other end beneath the tendon as far from scleral attachment as possible, each needle is carried through the tendon, avoiding the conjunctiva, and the free ends tied, thus fixing the loop of the tendon. The divided conjunctiva is brought together over the loop. Where the degree of deviation is considerable, it is well to precede the advancement of the weaker muscle by a tenotomy of the stronger one.

H. V. Würdemann, of Milwaukee, Wis., said that he had used the Beard form of advancement for about six years, more constantly than any other advancement operation for heterophoria and for strabismus cases, in which a decided amount of reposition of the recti muscles was needed. The operation is most satisfactory in strabismus cases of more than 15°, for less amounts than this or for heterophoria he preferred one of the minor forms of advancement operations, such as those of Stevens and Savage. As a rule he does not cut off the stump of the tendon as described by Beard, as the laying of one portion of the tendon over the other gives a more accurate hold, as in the healing process we get agglutination, and the small lump is sooner or later absorbed. Immediately after the operation we frequently find that the cornea is partially covered by a large piece of conjunctiva, but this is an advantage, for it lies under the stitch, and is a protection to the cornea; the reaction passes away in seven or eight days, sometimes sooner, then the stitch is removed. Braided silk is the best for this operation. He objected to the use of absorbable sutures in any form of advancement on account of the tendency to relaxation. We endeavor to get in advancement an over effect of 5 or 10°, as this may be readily corrected or disappear. The needles should be very sharp in order to get a good hold on the sclera.

G. Melville Black, of Denver, Colo., demonstrated an operation that he had devised which resembled this one closely. The needle is passed into the sclera, then through the suture above and the same below, making a slight incision on either side of it, then pass the tenotomy hook; the sutures are then passed just from beneath outwards; the muscle is then cut off, the tenotomy hook being removed, the sutures passed through the muscle, and are turned towards the cornea. The muscle is then advanced as far as wished aud sutures tied. The operation may be done in four minutes, and there is scarcely any reaction.

G. C. Savage, of Nashville, Tenn., criticised the Beard operation, as he said it was rather severe for the effect to be accomplished. He agreed with him that in straightening the eyes it is better to do a partial tenotomy of the offending muscle and an advancement of the other than to cut the muscles completely loose from the eyeball. A partial tenotomy ought always to be done in squint, and the rest accomplished by advancement. He preferred the Stevens advancement, the reaction being very slight; he preferred the operation of Black to that of Beard, as it was more simple, secured the same effect, and does not require a general anesthetic. In any operation the less traumatism we preduce in accomplishing our purpose, the less danger there is of infection.

J. E. Minney, of Topeka, Kas., asked if there was any difficulty with torsion in this operation, and if these muscles are both shortened and advanced.

C. H. Beard, of Chicago, Ill., said that he used to tie the sutures in a bow-knot at first, but found it diffiult to get patients to come back and have the knot adjusted. This is only one of the methods of treating strabismus and he had only used it in cases that did not yield to any other. Thirty or forty degrees of correction might be obtained by this operation; the operation prevents torsion; if the thread be properly inserted the muscle comes forward directly in line with its axis and there is no extra drawing at that point; he never uses a general anesthetic in any of these operations except in cases of little children.

J. O. McReynolds, of Dallas, Tex., said that one of the most important features to his mind was the employment of an absorbable suture instead of silk, because of the difficulty he found to get the silk out of the loop; this was almost as much of an operation as the original one; he considered the kangaroo tendon the best because it is absorbed slowly. By his operation he can secure as much correction as is desired, and if he wishes to get the maximum amount of correction he passes the sutures clear around the cornea to the opposite side.

Under Demonstration of Specimens and new Instruments:

H. V. Würdemann, of Milwaukee, Wis., demonstrated *Preparations of Macroscopic Eye Specimens in Glycerin Jelly.*

Geo. M. Gould, of Philadelphia, Pa., demonstrated: 1. *An Inexpensive Sixty Lens Ophthalmoscope without Rekossa Disk.* 2. *Demonstration of an Autofundoscope.*

ADJOURNMENT.

NEWS ITEMS.

Personals and items of interest should be sent to
Dr. Frank Allport, 92 State St., Chicago.

By direction of the Kultus minister (Germany), Professor Kuhnt, director of the Königsberg University Eye Klinik, has gone to Egypt and Palestine for the purpose of studying there the contagious diseases of the eye. The mission has reference to the increasing prevalence of such diseases, particularly of trachoma in east Prussia.—*Ann. Oph.*

Dr. M. Peschel has been appointed a. o. Professor of Ophthalmology to the University of Turin.—*Ann. Oph.*

Professor Silex of Berlin has given up his position as assistant in the University, to devote himself to his just established private clinic.—*Ann. Oph.*

The British Ophthalmological Society.—At the meeting of this society, held on July 8th, the following officers were elected: President, H. R. Swanzy; Vice-Presidents, Sir W. R. Gowers, Drs. Argyll Robertson, R. Marcus Gunn, R. Williams, E. Nettleship, Henry Eales, W. A. Brailey, Priestley Smith, F. R. Cross, and George Cowell; Treasurer, Dr. John Abercrombie; Secretaries, Dr. James Taylor and E. Treacher Collins; Librarian, W. Adams Frost.—*N. Y. Med. Record.*

A reorganization of the Louisville Medical College has been brought about, and Dr. William Cheatham of Louisville, Ky., has been given the Chair of Ophthalmology, Otology and Laryngology. Dr. Cheatham is thoroughly qualified to occupy this position, and his many friends are pleased that the Louisville Medical College has deemed it to their advantage to invite him to an honored place in the faculty.

The total number of blind in the United States is nearly 49,000, or 976 in each million of the population. The number of blind reported as receiving instruction is 4,691. The number of blind who are also deaf mutes is: Whites, 84 males and 107 females; colored, 28 males and 29 females. Blind and idiotic: Whites, 595 males and 463 females; colored, 66 males and 62 females.—*N. Y. Med. Record.*

THE CURE of glaucoma by resection of the superior cervical sympathetic ganglia is reported by Jonnesco, who has performed the operation seven times for this purpose and found the improvement marked and progressive, even in cases that had resisted iridectomy.—*Presse Méd., June 8.*

ONE OF the collaborators of the OPHTHALMIC RECORD, Dr. Edwin Van Millingen of Constantinople, Turkey, has, by order of the Sultan, been appointed Professor of Ophthalmology in the Imperial Military School of Medicine at Constantinople. Dr. Van Millingen is well known as being very proficient in his profession, and the appointment of a man of his caliber in a medical school in Turkey should mean much for the advancement of ophthalmology in that uncivilized monarchy.

THE

OPHTHALMIC RECORD

A MONTHLY REVIEW OF THE PROGRESS OF OPHTHALMOLOGY.

VOLUME VII. CHICAGO, OCTOBER, 1898. No. 10. NEW SERIES

ORIGINAL ARTICLES.

THE SURGICAL TREATMENT OF EXCESSIVE MYOPIA.

ROBERT SATTLER, M.D.
OF CINCINNATI, OHIO.

It was my intention to withhold for the present the report of this case and to include it later on with others which might be added, after additional experience with the surgical method for high myopia had been acquired. If I am led to mention it briefly at this meeting it is with the hope that it may encourage others, as it has me, to give to this method more deliberate and considerate attention and to seek opportunities to put it to the test in suitable cases. It is a subject which should and must have for us all an absorbing interest.

Two of the most gratifying results following double extraction of immature senile cataract, or sclerosis of the lenses, were observed in two old persons, both excessively myopic. The one, an old man, who formerly or since his earliest manhood, wore —10D. sph., was able after the operation to dispense with distance glasses and to resort only for reading to +1.75D. sph. The other patient formerly was aided by —16D. sph., but even with these she was not able to see for twelve or fifteen years before the operation as distinctly as she saw without any glasses or with —1.25D, sph. afterward. She could read without the assistance of lenses.

These two cases, and a visit to the clinics at Halle and Vienna in 1895. determined me to seek and to find the necessary opportunities to test this method in favorable cases on my return to this country. But even at my hospital and dispensary clinics and in private practice as well, so many difficulties were encountered among the few cases which were considered favorable for the operation, that during the intervening period only four cases were discovered. These were only with difficulty persuaded to have the operation performed.

So far as concerns this patient, or last case, the question whether it was really a case of excessive myopia suggested itself to me at once, after the favorable outcome of surgical interference was disclosed. Before surgical intervention it certainly had to be classed with the cases of excessive myopia. It presented all the clinical and ophthalmoscopic characteristics of these cases. The patient was practically blind without the assistance of strong concave lenses, —16D., which only afforded her vision of 0.2. She was not able to read without the aid of these same strong lenses, and with them so much difficulty was experienced that she was unable to attend school or acquire an education, much to her own sorrow and that of her mother, an exceptionally intelligent woman.

There were no uncommon ophthalmoscopic evidences, the refractive media was found clear and the cornea, on examination with the astigmometer, also free from marked irregularity of curvature. She was regarded as amblyopic in addition to the high myopic deformity. Subsequent developments, after removal of the lenses, however, proved conclusively that this was an erroneous conclusion, and that, on the contrary, she had normal perceptive ability of the retina in both eyes.

My explanation for the fortunate outcome in this case is that it was one of congenital malformation of the lenses, with preservation of their transparency, but altered indices of refraction of different sectors, associated with a moderate myopic deformity.

It is evident that such cases must necessarily be classed with those of excessive myopia, owing to their inseparable resemblance, and for the latter as well as the former ones, surgery alone affords relief. It is equally certain that in these exceptional ones the results of surgical treatment will be more favorable.

It would appear, however, that in this country there exists a marked scarcity of number, so far as these cases of excessive myopia are concerned, and which must occasionally include just such cases as the present one, for which surgical interference, having for its purpose the removal of the lens, is indicated. This method has, as we know, been practiced on such a large and successful scale in Europe.

We cannot even at our clinics and hospitals have command over our patients as is done abroad. Lengthy explanations are necessary to gain for the surgical treatment the consent of patients or that of their parents, and this to many surgeons is an irksome task. It may have happened that those cases which yielded to the advice and submitted to the operation were not as gratifying in their final results as was expected. These are among the probable explanations, and rather point to a lack of opportunity than a lack of interest for this comparatively new surgical departure. From a limited experience I take the history of this recent and last case:

Bessie S., æt. 16, Cincinnati, O.—Has been under my observation since early childhood. Hers was regarded as a case of congenital myopia, associated with a high degree of amblyopia. She had two brothers; both were excessively myopic, but the amblyopia did not appear so pronounced. Her father had a slight hypermetropic error, but his eyes were healthy and vision perfect. Her mother had compound myopic astigmatism, but with corrective lenses vision was excellent. Her maternal grandfather was myopic and three of her aunts. At the age of eight she was given —12D. After a careful test and ophthalmoscopic measurement, as nearly as could be determined she had a vision of about 0.1. Ophthalmoscopic examination disclosed only such changes at the posterior pole common to the myopic structure, and healthy and transparent dioptric media. Last year, under atropine, a careful re-examination of the refraction was made and also of the media and internal structures, lest the presence of a possible lenticonus or other lesion of the dioptric media or fundus might have eluded discovery. The results of former examinations were confirmed, nothing new developed, and only a higher correction, —16D., which afforded her almost 0.2 vision with either eye, was presented. About this time the operative treatment of myopia was explained to her mother and strongly urged and advised by me, and after much hesitation consented to.

The treatment by subsequent discissions after the first traumatism resulting in cataract was inflicted, proceded uneventfully and effected in both eyes complete absorption of the lenses. It was expected that the refraction would remain more or less myopic, after complete recovery had come about, owing to the apparently high degree of the error, but tests proved the contrary. July 2, 1898, confirmed a former examination, which disclosed H. 4.5 D, V=0.6 R. E. and H. 5 ⊃ Ha 1 ang. 70 L. E., V=0.6. Corresponding lenses were prescribed for distance, and in addition +3 5D. sph. one-half size lenses in grab frames, to be worn over her distance glasses for reading and close work. With their assistance she reads, at good range, without difficulty Sn. 1.

The Groton, Cincinnati, O.

Dr. George Ferdinands reports two cases of sympathetic ophthalmitis remarkable for the length of time that elapsed between the enucleation of the fellow eye for injury and the development of the sympathetic trouble—in one case eighteen years, and in the other about twenty-one years. The interval in the latter case is without precedent.—*British Medical Journal.*

EMMETROPIA, OR CORRECTED AMETROPIA.

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The table of Donders' and the following conclusions with regard to the recession of the near point are mainly based upon the investigations of that author, and have been for about half a century accepted by the medical profession: "After the age of 42 the near point recedes beyond twenty-two centimeters, and there is then present in the emmetropic eye presbyopia, which is corrected by such convex lens as will bring the near point back to twenty-two centimeters; after the age of 45 convex lenses are needed for reading and near work by all persons with emmetropic eyes; after the age of 45 myopia exists in those individuals whose near point is less than twenty-two centimeters; some emmetropes require convex lenses for reading or near work as early as the age of 40."

From more recent observation it seems quite probable that until the fifty-fifth year the near point of an emmetrope, or of a completely corrected ametrope, does not recede beyond twenty-two centimeters, and it is equally probable that in ametropic persons under the age of 55, lenses of the same focus can be worn for near or distant vision.

The following is the table which is generally accepted as the index to the presbyopia of the emmetropic eye:

Age.	P. Required.	P. Existing.	Presbyopia.
40	4.5	4.5	0
45	4.5	3.5	1.0
50	4.5	2.5	2.0
55	4.5	1.5	3.0
60	4.5	0.5	4.0
65	4.5	0.25	4.25
70	4.5	–1.0	5.5
75	4.5	–1.75	6.25
80	4.5	–2.5	7.0

The following is offered as a revision of the foregoing:

(Emmetropia, or Corrected Ametropia.)

Age.	Additional Lens Required.		
55	0.	to	0.50
60	0.	"	1.50
65	0.	"	2.25
70	0.50	"	2.75
75	0.75	"	3.50
80	1.50	"	4.00

Herewith is given an excerpt from Donders' table showing the recession of the near point:

Age	12	20	25	30	35	40	45	50	55
Centimeters	8	10	12	14	18	25	30	43	100

The revision below is thought to be more accurate:

(Emmetropia, or Corrected Ametropia.)

Age	15	20	30	35	40	45	50	55
Centimeters	?	7	10	12	14	16	19	24

When not complicated by pathological conditions, ametropia, in persons under 55 years of age, should not be considered as perfectly corrected if the distant vision, in the absence of accommodative effort, be less than six-sixths (six-sixths to six-ninths after the sixty-fifth year) with near vision lenses.

The above tables and conditions apply only when the latent ametropia is absolutely corrected in both eyes to within one-fourth of a diopter. Careful observation reveals the surprising fact that in a very large percentage of persons, regardless of age, there is present some form of latent ametropia.

From the above tables it may be seen that it is possible an individual with a simple binocular myopia of 3 D., possibly less, would not after middle age require lenses for near vision.

The foregoing conclusions are based upon the assumption that a "vision of six-sixths," (six-sixths to six-ninths after the sixty-fifth year) "in the absence of accommodative effort, constitutes emmetropia, or corrected ametropia." In these investigations, which were chiefly confined to ametropic cases, the astigmatism, when present, was first considered completely corrected, after which were added to the cylindrical correction, the strongest convex lenses or the weakest concave lenses, with which six-sixths (six-sixths to six-ninths after the sixty-fifth year) could be read.

In casually investigating these claims it would be well to select subjects from 50 to 60 years of age, who have not used lenses for near vision. It will be found that only a small percentage are myopic, the remainder most likely being emmetropic, or a trifle ametropic, and having a vision of six-sixths without the aid of concave lenses.

Binocular emmetropia is probably more of a rarity than is generally supposed. Perhaps one-tenth of 1 per cent, to 1 per cent. of individuals are so fortunate as to be emmetropic.

With the methods at present recommended by the text-books it is possible, with the exception of simple myopia, that a true estimate of ametropia is seldom obtained.

The following is a partial record of 100 consecutive cases of refraction, a careful review of which will give an idea as to the important rôle that latent ametropia plays in the recession of the near point:

Case I. Mrs. ——, aet. 45. R. V. 6/5; 6/6 with+1.50S. L. V. 6/5; 6/6 with +1.50S. Near point seventeen cm.

Case II. Mrs. ——, aet. 63. R. V. 6/5; 6/6 with+1.25S. L. V. 6/5; 6/6 with +1.25S. Near point sixteen cm.

Case III. Mr. ——, aet. 20. R. V. 6/4; 6/6 with+1.75S.⊃—0.25C. ax. 77°. L. V. 6/4; 6/6 with+1.62S. Near point seven cm.

Case IV. Mr. ——, aet. 28. R. V. 6/4; 6/6 with+2.50S. L. V. 6/4; 6/6 with+2.50S. Near point eight cm.

Case V. Mr. ——, aet. 33. R. V. 6/8; 6/6 with+1.00S.⊃—1.50C. ax. 97°. L. V. 6/8; 6/6 with+1.00S.⊃—1.00C. ax. 160°. Near point ten cm.

Case VI. Mr. ——, aet. 31. R. V. 6/6; 6/6 with+1.75S.⊃—1.00C. ax. 180°. L. V. 6/6; 6/6 with+1.75S.⊃—0.50C. ax. 180. Near point ten cm.

Case VII. Mrs. ——, aet. 37. R. V. 6/15; 6/6 with+5.00S.⊃—0.50C. ax. 105°. L. V. 6/15; 6/6 with+5.50S.⊃—1.00C. ax. 90°. Near point eight cm.

Case VIII. Mrs. ——, aet. 42. R. V. 6/6; 6/6 with+2.50S.⊃—1.25C. ax. 80°. L. V. 6/6; 6/6 with +2.50S.⊃—1.00C. ax. 105°. Near point fifteen cm.

Case IX. Miss ——, aet. 21. R. V. 6/4; 6/6 with+1.62S.⊃—0.50C. ax. 90°. L. V. 6/6; 6/6 with+1.87S.⊃—0.75C. ax. 67°. Near point six cm.

Case X. Mr. ——, aet. 36. R. V. 6/20; 6/8 with+7.00S.⊃—2.00C. ax. 30°. L. V. 6/15; 6/6 with+7.00S.⊃—2.75C. ax. 180°. Near point twelve cm.

Case XI. M. ——, aet. 75. R. E. Amblyopia. L. V. No record; 6/6 with +3.00S.⊃—1.25C. ax. 118°. Near vision with+4.75S.⊃—1.25C. ax. 118°.

Case XII. Mr. ——, aet. 53. R. V. 6/10; 6/6 with+2.50S.⊃—1.75C. ax. 25°. L. V. 6/8; 6/6 with+1.75S.⊃—1.00C. ax. 160°. Near point twenty cm.

Case XIII. Mrs. ——, aet. 45. R. V. 6/5; 6/6 with+2.00S.—⊃—0.50C. ax. 72°. L. E. Detached retina. Near point seventeen cm.

Case XIV. Mrs. ——, aet. 32. R. V. 6/5; 6/6 with+3.25S.⊃—0.50C. ax. 90°. L. V. 6/5; 6/6 with+3.50S.⊃—0.62C. ax. 90°. Near point eight cm.

Case XV. Mr. ——, aet. 22. R. V. 6/4; 6/6 with+1.50S.⊃—0.37C. ax. 180°. L. V. 6/5; 6/6 with+1.75S.⊃—0.75C. ax. 5°. Near point eight cm.

Case XVI. Mr. ——, aet. 47. R. V. 6/5; 6/6 with+2.00S.⊃—0.75C. ax. 90°. L. E. Amblyopia. Near point eighteen cm.

Case XVII. Miss ——, aet. 22. R. V. 6/15; 6/6 with—1.00C. ax. 180°. L. V. 6/18; 6/6 with—0.25S.⊃—1.00C. ax. 180°. Near point six cm.

Case XVIII. Mr. ——, aet. 24. R. V. 3/45; 6/6 with—5.75S.⊃—0.62C. ax. 180°. L. V. 3/45; 6/6 with—5.12S.⊃—0.62C. ax. 180°. Near point six cm.

Case XIX. Miss ——, aet. 18-24. R. V. 6/5; 6/6 with+2.00S. L. V. 6/5; 6/6 with+2.00S. Near point seven cm.

Case XX. Mrs. ——, aet. 58. R. V. 6/5; 6/6 with+2.00S.⊃—0.62C. ax. 180°. L. V. 6/10; 6/6 with+2.50S.⊃—1.50C. ax. 30°. Near point twenty cm.

Case XXI. Mrs. ——, aet. 53. R. V. 6/10; 6/6 with+3.25S.⊃—0.75C. ax. 90°. L. V. 6/10; 6/6 with+3.25S.⊃—0.75C. ax. 75°. Near point twenty cm.

Case XXII. Mr. ——, aet. 24. R. V. 6/5; 6/6 with+0.50S.⊃—0.50C. ax. 40°. L. V. 6/5; 6/6 with+0.50S.⊃—0.50C. ax. 97°. Near point eight cm.

Case XXIII. Miss ——, aet. 16. R. V. No record; 6/6 with+3.50S.○—0.50C. ax. 5°. L. V. No record; 6/6 with+4.50S. Near point six cm.

Case XXIV. Miss ——, aet. 19–24. R. V. 6/5; 6/6 with+2.75S.○—0.62C. ax. 180°. L. V. 6/5; 6/6 with+2.75S.○—0.25C. ax. 180°. Near point five cm.

Case XXV. Miss ——, aet. 16. R. V. 6/5; 6/6 with+1.75S.○—0.50C. ax. 100°. L. V. 6/5; 6/6 with+1.62S.○—0.37C. ax. 75°. Near point seven cm.

Case XXVI. Mr. ——, aet. 65. R. E. Amblyopia. L. V. 6/15; 6/6 with+5.00S.○—2.50C. ax. 20°. Near point seventeen cm.

Case XXVII. Mr. ——, aet. 37. R. V. 6/15; 6/6 with+2.00S.○—2.00C. ax. 95°. L. E. Leucoma. Near point seven cm.

Case XXVIII. Mr. ——, aet. 33. R. V. 6/5; 6/6 with+2.00S.○—1.00C. ax. 90°. L. E. Amblyopia exanopsia. Near point ten cm.

Case XXIX. Mr. ——, aet. 32. R. V. 3/40; 6/6 with—1.00S.○—1.50C. ax. 75°. L. V. 6/4; 6/6 with+1.50S. Near point ten cm.

Case XXX. Miss ——, aet. 16. R. V. 6/20; 6/8 with+8.00S.○—6.00C. ax. 180°. L. V. 6/30; 6/8 with+8.00S.○—6.00C. ax. 180°. Near point six cm.

Case XXXI. Mr. ——, aet. 45. R. V. 6/20; 6/6 with+2.00S.○—2.25C. ax. 95°. L. V. 6/9; 6/6 with+1.50S.○—1.25C. ax. 95°. Near point thirteen cm.

Case XXXII. Miss ——, aet. 11. R. V. 6/5; 6/6 with+1.50S. L. V. 6/5; 6/6 with+1.50S. Near point six cm.

Case XXXIII. Mr. ——, aet. 25. R. V. 6/6; 6/6 with+1.25S. L. V. 6/6; 6/6 with+1.50S.○—0.50C. ax. 17°. Near point seven cm.

Case XXXIV. Miss ——, aet. 27. R. V. 6/5; 6/6 with+2.50S. L. V. 6/6; 6/6 with+2.50S. Near point seven cm.

Case XXXV. Miss ——, aet. 12. R. V. 6/4; 6/6 with+3.00S.○—1.00C. ax. 90°. L. V. 6/4; 6/6 with+3.00S.○—1.00C. ax. 90°. Near point five cm.

Case XXXVI. Mrs. ——, aet. 35. R. V. 6/30; 6/6 with+1.50S.○—2.75C. ax. 180°. L. V. 6/30; 6/6 with+1.37S.○—2.00C. ax. 180°. Near point eleven cm.

Case XXXVII. Mrs. ——, aet. 43. R. V. 6/5; 6/6 with+2.25S.○—0.50C. ax. 75°. L. V. 6/5; 6/6 with+2.00S. Near point sixteen cm.

Case XXXVIII. Mr. —— , aet. 22. R. V. 6/8; 6/6 with+6.00S. L. V. 6/8; 6/6 with+6.00S. Near point seven cm.

Case XXXIX. Mrs. ——, aet. 40. R. V. 6/5; 6/6 with+3.50S. L. V. 6/5; 6/6 with+3.50S. Near point thirteen cm.

Case XL. Mr. ——, aet. 14. R. V. 6/4; 6/6 with+2.00S. L. V. 6/4; 6/6 with+2.00S. Near point six cm.

Case XLI. Mrs. ——, aet. 26. R. V. 6/5; 6/6 with+2.00S. L. V. 6/5; 6/6 with+2.00S. Near point eight cm.

Case XLII. Miss ——, aet. 14. R. V. 6/4; 6/6 with+1.62S.○—0.75C. ax. 112°. L. V. 6/4; 6/6 with+1.37S.○—0.25C. ax. 90°. Near point six cm.

Case XLIII. Mrs. ——, aet. 54. R. V. 6/10; 6/6 with+2.75S. L. V. 6/10; 6/6 with+2.75S. Near point fourteen cm.

Case XLIV. Mr. ——, aet. 13. R. V. 6/5; 6/6 with+2.00S.○—0.50C. ax. 180°. L. V. 6/5; 6/6 with+1.50S.○—0.50C. ax. 165°. Near point six cm.

Case XLV. Mr. ——, aet. 33. R. V. 6/4; 6-6 with+2.25S.○—0.50C. ax. 180°. L. V. 6/4; 6/6 with+2.12S.○—0.50C. ax. 180°. Near point ten cm.

Case XLVI. Mr. ——, aet. 28. R. V. 6/4; 6/6 with+2.00S. L. V. 6/4; 6/6 with+2.00S. Near point seven cm.

Case XLVII. Mrs. ——, aet. 31. R. V. 6/8; 6/6 with+2.00S.⊃—1.50C. ax. 170°. L. V. 6/8; 6/6 with+2.00S.⊃—1.75C. ax. 5°. Near point eight cm.

Case XLVIII. Miss ——, aet. 21. R. V. 3/50; 6/6 with—2.25S. L. V. 2/50; 6/6 with—4.00S. Near point six cm.

Case XLIX. Miss ——, aet. 48. R. V. 6/35; 6/6 with+0.25S.⊃—1.75C. ax. 132°. L. V. 6/35; 6/6 with—0.12S.⊃—1.00C. ax. 30°. Near point twenty cm.

Case L. Miss ——, aet. 20. R. V. 6/6; 6/6 with+1.50S.⊃—1.00C. ax. 180°. L. V. 6/5; 6/6 with+1.00S. Near point eight cm.

Case LI. Mr. ——, aet. 27. R. V. 6/6; 6/6 with+3.50S. L. V. 6/6; 6/6 with +3.75S. Near point seven cm.

Case LII. Mrs. ——, aet. 24. R. V. 6/4; 6/6 with+1.50S. L. V. 6/4; 6/6 with+1.50S. Near point eight cm.

Case LIII. Mr. ——, aet. 34. R. V. 6/4; 6/6 with+2.25S. L. V. 6/4; 6/6 with+2.25S. Near point eleven cm.

Case LIV. Mr. ——, aet. 23. R. V. 6/4; 6/6 with+2.25S.⊃—0.50C. ax. 75°. L. V. 6/4; 6/6 with+2.25S.⊃—0.50C. ax. 105°. Near point eight cm.

Case LV. Mr. ——, aet. 14. R. V. 6/5; 6/6 with+1.50S. L. V. 6/8; 6/6 with+2.25S.⊃—1.00C. ax. 100°. Near point six cm.

Case LVI. Mr. ——, aet. 31. R. V. 6/4; 6/6 with+1.37S ⊃—0.50C. ax. 165°. L. V. 6/4; 6/6 with+1.50S.⊃—0.37C. ax 15°. Near point nine cm.

Case LVII. Miss ——, aet. 19. R. V. 6/4; 6/6 with+2.00S. L. V. 6/4; 6/6 with+2.00S. Near point six cm.

Case LVIII. Mrs. ——, aet. 43. R. V. 6/5; 6/6 with+2.00S. L. V. 6/5; 6/6 with+2.00S. Near point 15 cm.

Case LVIX. Miss ——, aet. 17. R. V. 6/10; 6/6 with+0.50S.⊃—1.25C. ax. 105°. L. V. 6/12; 6/6 with+1.00S.⊃—1.75C. ax. 75°. Near point six cm.

Case LX. Mr. ——, aet. nineteen. R. V. 1/50; amblyopia exanopsia. L. V. 6/6; 6/6 with+3.75S.⊃—1.00C. ax. 165°. Near point six cm.

Case LXI. Mr. ——, aet. 23. R. V. 6/4; 6/6 with+1.75S.⊃—0.62C. ax. 5°. L. V. 6/4; 6/6 with+1.75S.⊃—0.62C. ax. 165°. Near point seven cm.

Case LXII. Mr. ——, aet. 27. R. V. 6/4; 6/6 with+1.50S. L. V. 6/4; 6/6 with+1.62S.⊃—0.37C. ax. 85°. Near point nine cm.

Case LXIII. Miss ——, aet. 14. R. V. 6/6; 6/6 with+3.75.⊃—2.50C. ax. 180°. L. V. 6/6; 6/6 with+3.75S.⊃—2.00C. ax. 10°. Near point six cm.

Case LXIV. Mr. ——, aet. 73. R. V. 6/50; 6/8 with+3.50S.⊃—1.00C. ax. 75°. Near vision with+5.50S.⊃—1.00X. ax. 75°. L. E. Amblyopia.

Case LXV. Miss ——, aet. 23. R. V. 6/4; 6/6 with+1.37S.⊃—0.62C. ax. 98°. L. V. 6/4; 6/6 with+1.62S.⊃—1.12C. ax. 83°. Near point seven cm.

Case LXVI. Mrs. ——, aet. 68. R. V. 6/15; 6/6 with+3.00S. Near vision with+4.75S. L. V. 6/15; 6/6 with+3.50S. Near vision with+5.25S.

Case LXVII. Miss ——, aet. 25. R. V. 6/4; 6/6 with+1.75S. L. V. 6/4; 6/6 with+1.75S. Near point eight cm.

Case LXVIII. Mr. ——, aet. 34. R. V. 6/4; 6/6 with+1.75S. L. V. 6/4; 6/6 with+1.75S. Near point eight cm.

Case LXIX. Mrs. ——, aet. 28. R. V. No record; 6/6 with+1.00S.⊃—3.25C. ax. 180°. L. V. No record; 6/6 with+1.00S.⊃—2.50C. ax. 180°. Near point eight cm.

Case LXX. Mrs. ——, aet. 52. R. V. 6/6; 6/6 with+3.25S.⊃—2.00C. ax. 180°. L. V. 6/6; 6/6 with+3.50S.⊃—1.75C. ax. 170°. Near point fifteen cm.

Case LXXI. Mr. ——, aet. 43. R. V. 6/5; 6/6 with+2.75S. L. V. 6/5; 6/6 with+2.50S. Near point thirteen cm.

Case LXXII. Mrs. ——, aet. 33. R. V. 6/5; 6/6 with+1.75S. L. V. 6/5; 6/6 with+1.75S. Near point eleven cm.

Case LXXIII. Mr. ——, aet. 27. R. V. 6/4; 6/6 with+1.50S. L. V. 6/8; 6/6 with+2.00S.—0.62C. ax. 77°. Near point eight cm.

Case LXXIV. Miss ——, aet. 23. R. V. 6/5; 6/6 with+3.00S. L. V. 6/12, 6/6 with+4.00S.⊃—0.75C. ax. 85°. Near point seven cm.

Case LXXV. Miss ——, aet. 21. R. V. 6/4; 6/6 with+1.75S.⊃—0.62C. ax. 162°. L. V. 1/50; Aphakia. Near point six cm.

Case LXXVI. Miss ——, aet. 22–28. R. V. 6/4; 6/6 with+1.62S. L. V. 6/4; 6/6 with+1.75S.⊃—0.25C. ax. 180°. Near point eight cm.

Case LXXVII. Mr. ——, aet. 27. R. V. 6/4; 6/6 with+1.75S.⊃—1.00C. ax. 93°. L. V. 6/4; 6/6 with+1.62S.⊃—0.75C. ax. 82°. Near point eight cm.

Case LXXVIII. Mrs. ——, aet. 58. R. V. No record; 6/6 and near vision with+4.00S.⊃—1.00C. ax. 17°. L. V. No record; 6/6 and near vision with+5.00S. ⊃—1.00C. ax. 105°.

Case LXXIX. Mrs. ——, aet. 27. R. V. 6/5; 6/6 with+3.25S. L. V. 6/5; 6/6 with+3.25S. Near point eight cm.

Case LXXX. Mr. ——, aet. 49. R. V. 6/6; 6/6 with+0.25S. L. E. Leucoma. Near point fourteen cm.

Case LXXXI. Mrs. ——, aet. 74. R. V. 6/8; 6/6 with+2.00S. L. V. 6/8; 6/6 with+2,00S. Near point twenty cm.

Case LXXXII. Mr. ——, aet. 33. R. V. 6/20; 6/6 with+0.75S.⊃—3.00C. ax. 14°. L. V. 6/20; 6/6 with+1.12S.⊃—2 50C. ax. 169°. Near point ten cm.

Case LXXXIII. Miss ——, aet. 17. R. V. 6/5; 6/6 with+2.00S. L. V. 6/5; 6/6 with+2.00S. Near point seven cm.

Case LXXXIV. Dr. ——, aet. 28. R. V. 6/6; 6/6 with+5.75S. L. E. Amblyopia exanopsia. Near point eight cm.

Case LXXXV. Miss ——, aet. 21. R. V. 6/5; 6/6 with+1.75S.⊃—1.50C. ax. 180°. L. V. 6/5; 6/6 with+1.75S.⊃—1.25C. ax. 180°. Near point seven cm.

Case LXXXVI. Miss ——, aet. 11. R. V. 6/5; 6/6 with+3.00S. L. V. 6/6; 6/6 with+3.00S. Near point five cm.

Case LXXXVII. Mr. ——, aet. 20. R. V. 6/4; 6/6 with+2.00S. L. V. 6/4; 6/6 with+2.00S. Near point seven cm.

Case LXXXVIII. Dr. ——, aet. 23. R. V. 6/4; 6/6 with+1.25S. L. V. 6/4; 6/6 with+1.00S. Near point seven cm.

Case LXXXIX. Miss ——, aet. 21. R. V. 6/5; 6/6 with+3.00S. L. V. 6/5; 6/6 with+3.00S. Near point eight cm.

Case XC. Mr. ——, aet. 59. R. V. 6/8; 6/6 with+1.50S.⊃—0.50C. ax. 125°. Near vision with+1.75S.⊃—0.50C. ax. 1.25°. L. E. Atrophy of zonula. Dislocation of lens.

Case XCI. Miss ——, aet. 19. R. V. 6/5; 6/6 with+1.75S. L. V. 6/5; 6/6 with+1.75S. Near point seven cm.

Case XCII. Mr. ——, aet. 19. R. V. 6/5; 6/6 with+3.50S. L. V. 6/5; 6/6 with+3.50S. Near point seven cm.

Case XCIII. Mrs. ——, aet. 45–60. R. V. 6/12; 6/6 with+3.50S.○—0.75C. ax. 180°. L. V. 6/12; 6/6 with+3.75S.○—1.25C. ax. 170°. Near point eighteen cm.

Case XCIV. Mr. ——, aet. 22. R. V. 6/4; 6/6 with+1.12S. L. V. 6/4; 6/6 with+1.50S.○—0.75C. ax. 83°. Near point seven cm.

Case XCV. Miss ——, aet. 23. R. V. 6/5; 6/6 with+1.50S.○—0.25C. ax. 170°. L. V. 6/5; 6/6 with+1.50S.○—0.25C. ax. 10°. Near point seven cm.

Case XCVI. Dr. ——, aet. 30. R. V. 6/5; 6/6 with+2.00S.○—1.00C. ax. 180°. L. V. 6/5; 6/6 with+1.75S.○—0.50C. ax. 25°. Near point ten cm.

Case XCVII. Mr. ——, aet. 8. R. V. 6/8; 6/6 with+3.00S. L. V. 6/8; 6/6 with+3.00S. Near point five cm.

Case XCVIII. Mrs. ——, aet. 25. R. V. 6/5; 6/6 with+1.50S.○—0.50C. ax. 2°. L. V. 6/5; 6/6 with+1.87S.○—0.62S. Near point eight cm.

Case XCIX. Mrs. ——, aet. 82. R. V. 6/9; 6/6 with+4.50S. Near vision with+8.00S. L. V. 6/12; 6/8 with+5.00S. Near vision with+8.50S.

Case C. Mr. ——, aet. 32. R. V. 6/5; 6/6 with+2.75S. L. V. 6/5; 6/6 with +2.25S. Near point nine cm.

A CASE OF QUININE AMAUROSIS.

BY JAMES MOORES BALL, M.D.

ST. LOUIS, MO.

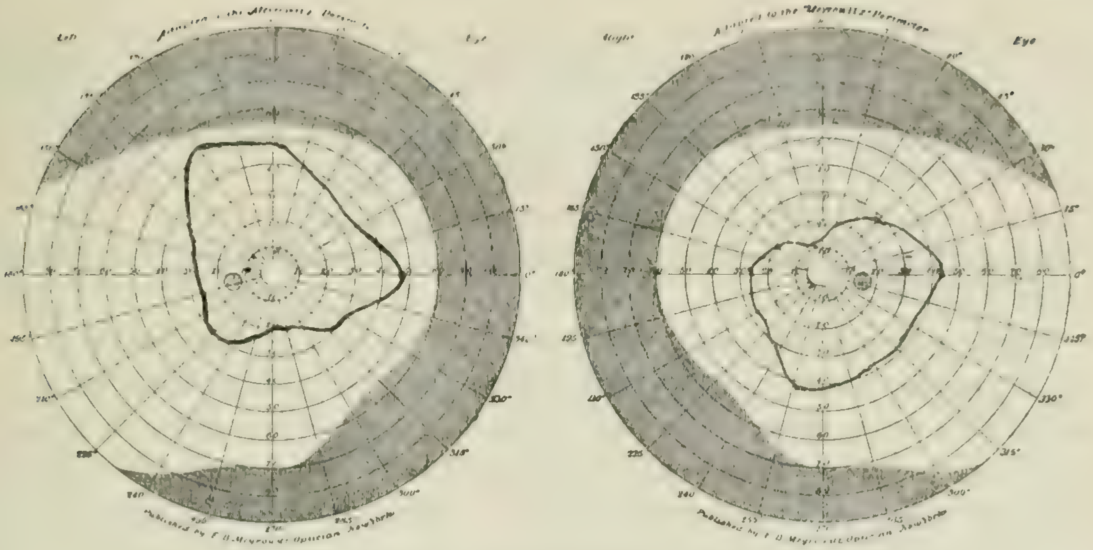
Professor of Ophthalmology in the St. Louis College of Physicians and Surgeons, Oculist to the St. Louis City Hospital.

Illustrated.

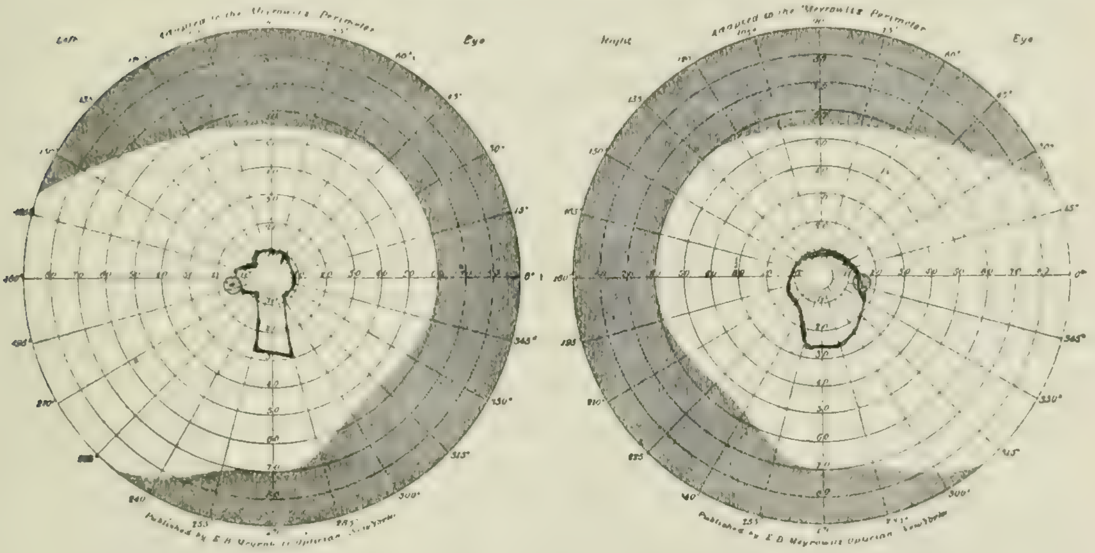
Frederick H——, aged 61, German, of strong physique, horse-collar maker by trade; was admitted to the St. Louis City Hospital March 28, 1897. He has always had good health, except that he has had an ulcer of the leg for a long time, and has suffered from malaria for several succeeding summers. He has been in the St. Louis City Hospital for treatment of the ulcer.

Recently he had malarial fever. He was given 60 grains of quinine in pill form in twelve hours. The next morning he was totally blind. I saw him on the third day after the ingestion of the drug. He was very deaf; both pupils widely dilated and irresponsive to light; vision reduced to perception of light in right eye, fingers counted at four inches with left; tension normal. The ophthalmoscope showed marked contraction of the retinal vessels, both arteries and veins. The optic papilla was somewhat pale, as was also the retina. I must remark, however, that with the exception of the contraction in the caliber of the vessels, the ophthalmoscopic changes were not as marked as I had expected to find. No doubt if the examination could have occurred within a few hours after the quinine was taken the papilla would have been white, and the retina almost bloodless.

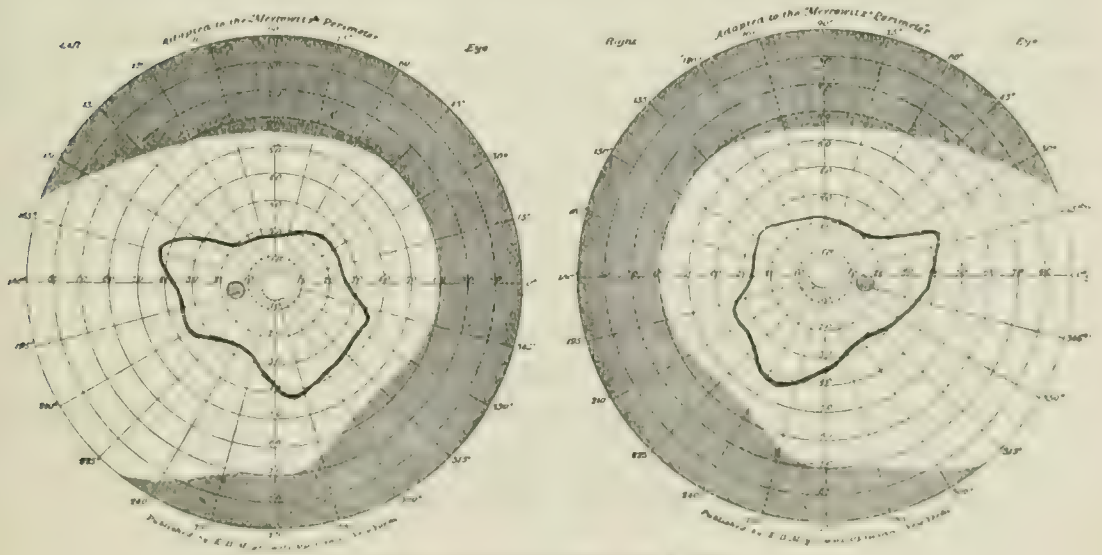
The diagnosis of quinine amaurosis was made. No drugs were given in the treatment of the case. The patient was directed to remain in the recumbent position, and was allowed a liberal diet. A favorable prognosis was given.



Fields of vision two weeks after taking sixty grains of quinine in twelve hours.



Field for red, thirty-six days after taking sixty grains of quinine in twelve hours.



Fields for white, February 5, 1898.

Two weeks later vision had improved so that it was as follows: R. E.=20/100; L. E.=20/80. The fields of vision were taken, and are shown in the accompanying figures.

On February 5, 1898, I found the patient's condition as follows:

V in R. E.=20/120; with+2.50=20/30.
V in L. E.=20/120; with+2.00=20/20.

Reads Jæger 1 at 10 inches, with+6.00 in each eye. Fields for white are shown in accompanying cuts.

While this condition is called quinine amblyopia it may be caused by any of the alkaloids found in the bark, or may result from a large dose of the tincture of the bark. The sulphate and bisulphate are more active than other salts. Owing to the fact that in most of the cases the patients were suffering from general diseases, such as malaria, syphilis, meningitis, pneumonia, typhoid, gastro-enteritis, etc., it has been doubted that the blindness was due to the ingestion of quinine; but, on the other hand, the exact clinical picture of quinine amaurosis can be produced in dogs, and in Giacomini's case a healthy individual took 3 drachms of quinine by mistake, instead of cream of tartar. "Within an hour he felt great pain in the head, stomach-ache, dizziness, general debility, and finally became unconscious. The face was pale; the lips and extremities were livid and cold. The pulse was uniform, slow, hardly perceptible; the respiration sluggish. The pupils were very much dilated. When consciousness returned, sight and hearing had almost entirely vanished. The general prostration and weakness of sight and hearing lasted a long time."* This case occurred in 1845, before the days of ophthalmoscopy.

The dose causing blindness has varied from fifteen grains to an ounce in twenty-four hours; occasionally temporary blindness has appeared after the administration of 15 grains in divided doses in twenty-four hours. Of 69 cases gathered from literature by de Schweinitz† 42 were males, 20 females, and in 7 the sex was not given. The ages varied from 3 to 65. Thirty-four were under 40 years of age. One case is recorded in which a negro became blind from quinine.

The symptoms in quinine-amaurosis are:

1st. Total blindness following the ingestion of large quantities of quinine.

2d. Pallor of optic discs.

3d. Marked contraction of the retinal blood vessels.

4th. Contraction of the visual fields.

The pupils are widely dilated and do not contract on exposure to light; but, according to some observers, they contract to a slight extent on accommodative effort. This was true of my patient.

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* Gruening: Archives of Ophthalmology. Vol. X., p. 82.

† De Schweinitz; Toxic Amblyopias. Philadelphia. 1896.

The prognosis is favorable so far as the restoration of central vision is concerned. In grave cases the visual field is not restored in its entirety. In one instance the patient was practically blind two years after the administration of quinine, vision in the better eye being equal to perception of movements of the hand at six feet. It is probable that other cases equally unfortunate have occurred but have not been reported.

To explain the occurrence of this kind of amaurosis we must look to the vaso-motor system. In dogs poisoned by quinine de Schweinitz found thickening and changes in the walls of the optic nerve vessels (endo-vasculitis), thrombosis of the central artery with organization of the clot, and complete atrophy of the visual tracts.

OCULAR THERAPEUTICS—A REPORT.

BY MELVILLE BLACK, M.D.
DENVER.

Anything new in this line that has established value is already an old remedy. The few agents that I shall recognize I have given personal trial. While I have not as yet been able to thoroughly satisfy myself that they possess all the virtues claimed for them by their advocates, I am convinced that they have merit, and shall continue to give them further trial.

Dr. Sinclair Tousey says, in *The New York Medical Journal*, November 6, 1897, in an article largely devoted to keloid, that thiosinamine, an alkaloidal derivative of the oil of mustard seed, is of value in producing absorption of corneal opacities. His method of administration is to give hypodermically one and a half grains in the triceps muscle every third day until about twenty-seven injections have been given. He claims that it has no deleterious effects upon the human organism. His explanation of how it produces absorption of cicatricial tissue is that it "produces a tremendous cellular activity in the circulating medium, which calls forth a coördinate activity in the leucocytes and fixed connective-tissue cells throughout the organism, and increased removal of effete or lowly organized material by way of the blood and lymph channels. This view is strengthened by recorded observations of diuretic action when beginning its use." For hypodermic injection the drug does not keep well in watery solution. He recommends that it be dissolved in a sterilized solution of glycerine and water, in the proportion of ten parts of thiosinamine to one hundred parts of the glycerine and water solution.

I have used this remedy in two cases of corneal leucomata. In each case the dense opacity was markedly reduced both in size and density. Sufficient clear cornea was obtained at the corneal margins to warrant an iridectomy with a view to restoring some vision to the eye. It was not deemed prudent to do this in either case because the fellow eye was perfect. I could not see that any annoying systemic symptoms followed its use. I would recommend its trial by others.

An interesting article appeared in the *Cleveland Medical Gazette*, wherein Dr. Thomas H. Pleasants, of Helena, Mont., gives his experience with Doctor Santarnecchi's method of "Hydraulic Curetting of the Cornea." His method of hydraulic curetting is as follows: A syringe, holding about an ounce, is fitted with a fine nozzle, which has about the same caliber as a fine hypodermic needle. The syringe is filled with a 1-1000 solution of bichloride. After instilling several drops of 1 per cent. solution cocaine into the eye, and waiting a sufficient time for its anesthetic effect, he separates the lids as widely as possible, and, directing the jet of sublimate solution against the ulcer or wall of the corneal abscess, gradually increases the force of the stream until the last portion of adherent ulcerated tissue is removed. He reports three cases: one of corneal ulcer with hypopion; one of traumatic infectious ulcer, with extensive corneal infiltration, and lastly a case in which both corneæ have been injured by the lodgment of foreign bodies, resulting in extensive corneal ulceration in the one first involved, with every prospect of the same condition resulting in the one last injured. The hydraulic curetting was repeated every day or every other day according to the indications. The eye is kept bandaged during the interim. He claims that the reaction is slight, and that there is little or no pain. The repair is rapid. Hypopion is soon absorbed. He finds that the results obtained under this treatment exceed those obtained under any other, and advises strongly that it be tried.

I can indorse all that Doctor Pleasants has said in so far as my experience with the procedure will permit. It would seem to be the most natural way of removing infectious necrotic material from an ulcerating surface, and is certainly productive of less traumatism than that obtained by the curette or actual cautery.

Dr. W. H. Bates, in *The New York Medical Journal*, continues to recommend the use of an 80 grain solution of the dried extract of suprarenal capsules, together with cocaine, to produce complete anesthesia, where the use of cocaine alone will not suffice. He claims to be able to produce complete anesthesia, no matter how much inflamed the eye may be, and to be able to prolong anesthesia indefinitely in protracted operations. Bleeding is almost nil. The suprarenal solution is first used, and after a few instillations the cocaine is used.

Doctor Bates first advocated the use of the suprarenal several years ago, and at that time I gave it a trial. I only used it in one case, which was hardly fair, but the reaction which followed its use was so extreme that I felt afraid of it. The case was one of hypopion-keratitis, with the ocular conjunctiva looking like a piece of raw meat. I used it purely to see what influence it would have upon such an injected membrane. In a very few moments it bleached the ocular conjunctiva to a dirty white, with scarcely a blood vessel to be seen. Its action as a vaso-constrictor was certainly wonderful. As soon as the vessels began to dilate again the patient complained of severe pain in the eye, and it was with difficulty that he controlled himself. This pain lasted about half an hour, when it gradually subsided under the use of hot applications. Within the last year I have been using the suprarenal in occasional cases where it was desirable to have a field of operation free from blood and protracted anesthesia. Here it has proved very satisfactory, and no pain followed its use.

Dr. William Cheatham's paper on Jequirity in the *Journal of the American Medical Association*, January 15, 1898, was interesting, not because he was advocating something new, but because of the indorsement of a grand old remedy that is falling into disuse. No doubt Dr. Cheatham learned to use Jequirity while he was interne in the Manhattan Eye and Ear Hospital. So did I. We evidently learned not to be afraid of it. We learned to use it there in the form of an infusion. It would seem that we have both departed from our early teaching in that the powder dusted into the eye, or rather over the everted lids, is found to be more satisfactory. Jequirity will cure pannus when nothing else will.

Protargol seems to be the latest product of silver to attract our attention. It is really an albuminate of silver in the form of a yellowish powder that is soluble in water. It does not precipitate nor form new combinations with chlorine nor coagulate albumen, hence is supposed to penetrate more deeply into the tissues than silver nitrate. It also has the advantage of being almost entirely non-irritating. Dr. Adolph Alt, of St. Louis, in an article in the *American Journal of Ophthalmology*, indorses it very highly. He finds it equally as useful as silver nitrate, and to be non-irritating.

I have been using Protargol for about three months, and have not satisfied myself as yet that it is a complete substitute for nitrate of silver. I have been wedded to the latter product for a long time, and am loath to give it up. I must say, however, that protargol seems to be giving good results where I have used it, but in most of my cases which would have put it to test I have used silver because I knew what it would do, and I did not want to take any chances with a remedy still under trial. One case of gonorrhœal ophthalmia that came to me after the cornea had ruptured has responded like magic to a 5 per cent. solution of protargol. In three days' time all purulent discharge had ceased.

PARINAUD'S CONJUNCTIVITIS.

BY FRANK W. MILLER, M.D.

RED OAK, IOWA.

Parinaud's Conjunctivitis: June 28, 1898.—Harry M., farm-boy, age 12 years, says that three days ago was struck in right eye with boxing glove. Lids immediately began to swell, and in twenty-four hours was unable to open them—the glands of the face and neck became swollen, and the eye was discharging freely.

Present condition: L. E., normal; R. E., lids œdematous and red; muco-purulent discharge oozing from between them, and "scalding" cheek. Pre-auricular and cervical glands under angle of jaw swollen, red and exquisitely tender—those in front of ear threatening to suppurate. On separating lids found bulbar conjunctiva moderately injected and cornea normal. On everting lids retro-tarsal folds—especially upper—very much thickened and congested. On tarsus (upper) were four well marked abscesses or pustules, varying from 2 to 5 mm. in diameter, of a greyish-yellow color, very tender, and on incision discharging a drop or two of thin pus. The ulcers that followed were rough and irregularly cut, with considerable of granulation tissue. They healed very kindly. The pustules were separated by a very œdematous and almost granular conjunctiva. On the lower tarsus were two or three similar processes, but smaller. They were not incised; one finally discharged, leaving a small ulcer; the others were absorbed. The lymphatic glands did not suppurate and the infection subsided as the eye improved. In three weeks healing was complete and perfect. The patient incidentally had a very severe attack of tonsillitis.

A NEW TREATMENT FOR TRACHOMA—PRELIMINARY REPORT.

GEORGE F. KEIPER, A.M., M.D.

LAFAYETTE, IND.

Eye and Ear Surgeon to St. Elizabeth Hospital, St. Joseph Orphan Asylum, Indiana State Soldiers' Home, etc.

Illustrated.

The treatment to which I desire to direct the ophthalmic world is that of interstitial electrolysis. Interstitial electrolysis is sometimes called metallic electrolysis. It has been used extensively in other parts of the body in the treatment of diseased conditions, but, so far as I can find out, the application of the principle has never been made to trachoma.

The feature of the treatment in general is to dissolve an electrode made of copper, iron, silver, zinc, etc., in the tissues by the means of the galvanic current, the soluble electrode being at the positive pole of the battery.

The solubility of a pure copper needle may be very easily demonstrated by thrusting it into a piece of lean beef, and after connecting the needle to the positive pole and a dispersing electrode to the negative pole of the battery (applying it to the meat at some distance if possible), turn on the current of electricity. After a time the meat, when cut open, will show an apple-green color. Chemical analysis shows this to be oxychloride of copper, a very powerful germicide. It will also be noted that it is diffused, and not confined to the location of the needle. It will also be noted that the diffusion is toward the negative dispersing electrode. This diffusion is known as cataphoresis.

Again, take an ordinary copper point, such as is shown in figure 2, and put it at the positive pole of the battery; hold it on the surface of the meat and put a dispersing negative electrode close by, and the surface of the meat is discolored green, and the color is diffused into the tissue in the direction of the negative electrode. The chemical reaction is the same as in the first instance. In this process oxygen, hydrochloric acid, and sulphuric acid are formed, which, uniting with the copper, forms the oxychloride of copper. This is in a nascent state. For a fuller account of interstitial electrolysis and cataphoresis I would respectfully refer the reader to Bigelow's *International System of Electro-Therapeutics*, or Scheppegrell's new work on *Electricity in Diseases of the Nose, Throat and Ear.*

THE NECESSARY EQUIPMENT.

First. A good battery, say of twelve cells. No particular make is recommended, because the number of responsible manufacturers is very large and their wares are first-class.

Second. A milliamperemeter. No current should be passed through an eyelid without being carefully measured. It should be "dead beat," i. e., not influenced magnetically by the presence of steel or iron in its neighborhood. The Weston and Kenelley meters are the best.

Third. Several pure copper electrodes. The ones whose illustrations are submitted below I have found best.

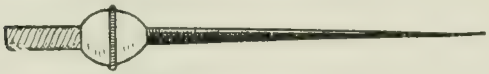

FIG. 1.

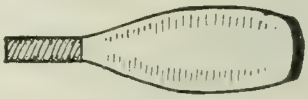

FIG. 2.

Figure 1 is tipped with the minutest quantity of silver to facilitate its introduction into the substance of the lid, though the one illustrated by figure 2 is sufficient when applied to the surface of the conjunctiva of the everted lid. The electrodes should be made so that they will fit the universal handles. The dispersing electrode may be the ordinary hand carbon, one usually found with modern batteries.

THE TECHNIQUE.

A four per cent. solution of cocaine is dropped into the eye, and again dropped in in three minutes. After waiting five minutes the lids are sufficiently anesthetized for work. The patient then is given the dispersing electrode connected to the negative pole of the battery, and may either hold it in his hand or may hold it on the back of his neck. The surgeon stands behind the patient, everts the affected lids, and with the blunt-pointed electrode rubs gently the conjunctival surface of the lid. The milliamperemeter should not register over five milliamperes during this procedure. Three milliamperes is generally all that the majority of patients can stand. The seance lasts for five minutes. After treatment patients complain of some smarting and stinging, due, no doubt, to the deposit of the oxychloride of copper within the substance of the lid beyond the reach of the cocaine. The treatment should be repeated twice weekly.

The copper needle may be thrust into each granulation, the current turned on, observing the same precaution as in the use of the blunt electrode.

The question may now be asked, To what forms and conditions of trachoma is this treatment applicable? To which may be replied: To those forms in which the copper sulphate pencil is usually applicable, and no others.

The cases upon which this form of treatment has been tried have so far progressed favorably, and the hint is thrown out that it may have a universal trial at the hands of all ophthalmologists possible, so that quickly may be determined its true value as a remedial agent in trachoma.

A SATISFACTORY METHOD OF REMOVING POWDER STAINS IN FRESH CASES.*

BY J. W. HEUSTIS, M.D.
DUBUQUE, IA.

Several years ago an operation was brought to my notice for the removal of powder stains or grains of powder imbedded in the skin from recent accident or explosion. From time immemorial it has been the custom of many to attempt the extraction of powder from the skin with a needle or other sharp-pointed instrument. In some cases this procedure has been partially successful, but in most cases a blue stain is left. It is almost impossible to remove the grains of powder intact, and where one is broken a staining of the tissues surrounding it is sure to result, and this discoloration is permanent.

The operation to which I wish to call attention is so simple and effective that when once tried will always be used. The patient must first be thoroughly anesthetized. Then with a stiff nail-brush, and using soap and water rendered antiseptic by carbolic acid, bichloride solution, or any other antiseptic that may please the operator, scrub the part thoroughly. Do not hesitate to draw blood, and do not cease until the grains of powder have been entirely removed and face, hands, or other surface are clean. Should it become necessary to remove the entire cuticle do not hesitate to do so, as it will reform in a few days. It is sometimes impossible to eradicate a deep spot entirely, and in this case a smooth, elliptical incision is to be made, the stain removed, and a light suture inserted. Following the operation of scrubbing, it is only necessary to cut a covering the shape of the surface denuded, soak it in carbolized oil and apply. The next day the patient is liable to complain of a stiffness of the skin of the affected parts, which passes away in a short time. After the skin has resumed its normal condition it may be necessary, where blue spots may be seen remaining, to remove by the elliptical incision previously mentioned.

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*This procedure was recommended to me by my friend Heustis a number of years ago, and it has rendered me such good service, and seems to be so little known, that I have asked him to write it up for the RECORD, H. GIFFORD.

I have performed this scrubbing operation many times and have yet to note its first failure of success, either in my hands or those of my friends to whom I have recommended it and by whom it has been tried.

Treatment of Strabismus.—At the July meeting of the *Paris Academy of Medicine*, Dr. Panas communicated some observations on this subject. He said that the squinting eye was the one which deviated most from the line of vision. Nevertheless strabismus was only apparently unilateral. If the phenomena accompanying this condition were analyzed in detail it would be found that the strabismus was always bilateral, and if it appeared unilateral that was because the patient only used the eye which was least affected, and in overcoming the deviation of this one exaggerated the obliquity of the other. As for therapeutic measures, Dr. Panas held that as the affection was bilateral there must be a bilateral operation. In 230 cases Dr. Panas performed tenotomy of both internal recti, and stretched them in addition, thus lessening their tendency to overaction. Dr. Panas never performs advancement, finding a simple tenotomy sufficient. In 220 cases he had never seen any overcorrection, or if there were a little it was only temporary. Of 220 convergent cases of strabismus, he had 190 in which the result was immediately successful. In those which were unsuccessful the result was not overcorrection but undercorrection. In ten cases Dr. Panas rectified this by advancement of the antagonistic muscles, and in every case with success.—*London Lancet.*

In the *Lancet* of July 2, 1898, Sydney Stephenson reports the results of his experiments with mydrin, which is a combination of ephemdrin hydrochloride and homatropine hydrochlorate. The author has reached the conclusion that it was capable of doing all that had been claimed for it—namely, its capability of causing moderate dilatation of the pupils without involving the function of accommodation. He believes it to be a valuable agent in the hands not only of the ophthalmologist, but also of the physician desirous of examining the fundus oculi with a dilated pupil.

THE
OPHTHALMIC RECORD.

A MONTHLY REVIEW OF THE PROGRESS OF OPHTHALMOLOGY.

VOLUME VII. CHICAGO, OCTOBER, 1898. NO. 10. NEW SERIES

EDITORIALS.

TO OUR READERS: With a desire to afford the widest discussion of questions in Ophthalmology the OPHTHALMIC RECORD has published leading articles furnishing the views of all schools of thought, it being well understood that the writers are alone responsible for the opinions therein expressed. In the September issue such an article was printed (*Pathology and Surgery vs. Etiology and Therapeutics*) which contains certain statements in regard to pathology and surgery at variance with the beliefs of many experienced ophthalmologists that it now seems necessary to repeat the statement—particularly as the article in question was unsigned—that the staff of this journal is not as a whole, or in any sense, responsible for, or necessarily in accord with this or other leading articles appearing in its editorial pages.

THE APPARENT SIZE OF THE ERECT IMAGE OF THE OPTIC DISK.

Some years ago, in Berry's *Diseases of the Eye*, first edition, 1889, page 573, I found the statement that, taking the distance from the second nodal point to be 15 millimeters, and neglecting any change caused in it by the necessary accommodation, the definition (apparent size of the optic disk) would be about the same as that of a penny (English) held at about ten and eleven inches from the eye. Berry gives the actual diameter of the disk (*post-mortem*) as 1.75 millimeters and the diameter of a penny as 31 millimeters. "The magnification," he says, "is then as 31 to 1.75, or roughly 18 diameters, if we compare the ophthalmoscopic distinctness of the image with that which the naked eye would give of the disk * * * at about 10½ inches from the eye."

A few years later, the excellent text-book of de Schweinitz[*] contained the following: "The optic disk, which measures about 1.5 millimeters, appears under this method (direct) nearly the size of a 25-cent piece. This, however, is only relative to the distance it is projected." Both authors refer to the examination of an emmetropic eye by an emmetropic eye.

These comparisons were to me somewhat startling, as I had never seen an optic disk that appeared to me anywhere near the size of an English penny or an American 25-cent piece. I have since then attempted many times by mental effort, or change of "distance of projection" even to "infinity," to convey to my consciousness an image ranging from 23 to 31 millimeters in diameter, but it has been impossible. Under emmetropic conditions of both myself and patient, my consciousness gives me an image of about 13 millimeters in diameter, and this size varies but little, whether I adjust my "projection" for 25 centimeters (10 inches) or for "infinity."

I know very well that in the dissected eye the optic disk measures from 1.5 to 1.75 millimeters in diameter. I am also familiar with the mathematical formulæ by which the magnification of the erect image is determined. Mathematically considered, it is true that this image should appear to the observer with good accommodation, his vision being adjusted for a distance of 20 centimeters (7 inches) to 30 centimeters (12 inches), from thirteen to twenty times as large as the disk itself, or as having a diameter of 20 to 30 millimeters. Without accommodation or for an adjustment to a greater distance than 20 to 30 centimeters, it would appear proportionately larger. [†]Zander gives the magnification as 14⅓ diameters, with a visual projection of 8 inches; [‡]Loring, 14⅓ diameters, with the same projection; [||]Landolt, "an enlargement equal to 20 millimeters" (13⅓ diameters) with projection at 30 centimeters; [§]de Wecker and Masselon, "17 to 20 times," projection 25 to 30 centimeters; [¶]Fuchs, 14 diameters; [**]Panas, 20 diameters; [††]Fick, 17 diameters; [‡‡]Tscherning, about 13 diameters; projection, 20 centimeters. Thus it will be seen that the comparisons drawn by Berry and de Schweinitz are confirmed. But does consciousness really picture an image of any such size?

[*] *Diseases of the Eye*, first edition, 1892, page 99.

[†] *The Ophthalmoscope*, by Carter, 1866, p. 86.

[‡] *Text-Book of Ophthalmoscopy*, 1886, vol. I, p. 142.

[||] de Wecker and Landolt's *Traité Complet d'Ophtalmoloqie*, 1880, Tome I, p. 815.

[§] *Manuel d'Ophtalmologie*, 1889, p. 960.

[¶] *Text-Book of Ophthalmology*, by Duane, 1892, p. 7.

[**] *Traité des Maladies des Yeux*, 1894, Tome I, p. 184.

[††] *Diseases of the Eye and Ophthalmoscopy*, by Hale, 1897, p. 108.

[‡‡] *Optique Physiologique*, 1898, p. 178.

As already stated, I have never been able to perceive one larger than 13, perhaps 14 millimeters, in diameter, with *any adjustment* of my vision. I have interrogated others, and they tell me that such is their own experience. I have measured drawings made of the erect image by many authors, and I find the diameters of their optic disks to range from 13 to 16 millimeters. Some are drawn a little larger.

These "psychological" measurements are so much at variance with those determined by mathematical calculations, that I am led to express my doubt as to the erect image ever appearing to anybody, under emmetropic conditions, as being the size of an English penny, (about that of our 50-cent piece) or of a 25-cent piece. It is more nearly that of the old style, silver 3-cent piece. A. A. H.

THE EDUCATION OF THE OPHTHALMOLOGIST.

In spite of important advances in medical education during the past decade, comparatively little has been said, done or written toward guiding the medical student to a due preparation for following any particular branch of medical science, or, in familiar parlance, helping him "to take up a speciality." Well-balanced medical men disparage the tendency to specialism; they see in it a drift toward narrowness, superficiality and ignorant exaggeration, and insist, with reason, that the best preparation for following a specialty is a thorough education, supplemented by ten years or more of general practice.

It needs no argument to demonstrate the value of such preparation in the recognition and successful treatment of maladies of the eyes, so many of which are the result of systemic disease. But with these all analogies end, and there remains a very large portion of the field of ophthalmology which is peculiar to itself, and which must be studied for itself, *not* after years of general practice when habits of thought and life have been formed and technical knowledge is with difficulty acquired, but during young student life. Ophthalmology is peculiar to itself in respect to the study of ocular physiology and dioptrics, light and color perception, binocular vision, opthalmoscopy, skiascopy, keratometry, perimetry, etc., and no amount of experience in other departments of medicine is of the slightest assistance in understanding them. The proper detection of errors of refraction alone requires the highest technical skill, and constitutes about three-fourths of the oculist's labor, and it is precisely with respect to refraction and binocular vision that the average oculist is found wanting *practically*.

Now, it is manifest that a substantial advantage in regard to these branches accrues to the medical student who, with intent to become an ophthalmologist, thoroughly grounds himself theoretically and practically in them.

Heretofore ophthalmology in America has been recruited in the majority of instances in the person of physicians who have taken it up as an after thought; stumbled into it with little or no specific preparation, to say nothing of a lack of university training, and their incompetence has been in proportion. Many attempt to patch up their deficiences by taking a course in some post-graduate or rapid-firing "ophthalmic college," but the foundation is wanting and the superstructure remains imperfect. To give the student an adequate foundation requires a radical departure from present methods. Neither theoretical nor clinical instruction in refraction and accommodation, and their anomalies can, for instance, be adequately taught in didactic lectures or by text-books, or in our clinics as usually conducted. The theoretical instruction should, it is believed, be carried out by dividing the classes into sections and requiring blackboard demonstrations exactly as in the case of mathematics, with such works as those of Donders and Landolt as guides, together with practical work in a well equipped ophthalmological or physiological laboratory in accordance with modern university methods.

With a groundwork of physiology, chemistry, physics and mathematics those branches of ophthalmology peculiar to itself can be mastered in a university preliminary medical course and the time spent in a medical college actually shortened.

It would be an advantage to all medical students, and to the prospective ophthamologist indispensable. F. B. E.

SOME ASPECTS OF THE TRACHOMA QUESTION.

For one who has lived long in a trachoma-infested region with a mixed population it is hard to repress a smile at the attempts to account for the occurrence of the disease by the shape of the head or the race-ancestry of the individual. He finds trachoma distributed impartially among long-headed Swedes, round-headed Bohemians, Irish Celts and North German Teutons; and while with all nationalities it is much more common among the lower classes, the fact that dirt alone cannot account for it is shown by its invading the sacred precincts of the "best families" when any one of them is unfortunate enough to get a nurse girl with an inconspicuous form of the disease. The case of the African needs special consideration, for there seems to be no question of the accuracy of Burnett's observation that the American negro is almost entirely free from it. But in view of the fact that when the negro mixes more freely with other races, as in Egypt, Turkey and Brazil, he contracts trachoma with facility, it seems reasonable to accept the explanation of Pitts that the apparent immunity of the race in this country is largely due to its isolation. The ancestors of our slaves came almost entirely from the west coast and the interior of Africa, where the absence of trachoma can perhaps be accounted for, to some extent, by the low estimate in which the ordinary vehicles of contagion, clothing, towels and washing utensils, are held.

Regarding the germ of trachoma we unfortunately know no more than ever. Aspirants for the distinction of discovering it are plenty but each one finds a different germ. In spite of this, the clinical evidence is such that it is hard to believe that there are any who really disbelieve in the specific, contagious nature of trachoma. For any such, the personal experience of the writer may be of interest. On the sixth or seventh day after getting a drop of blood from a trachomatous lid into his left eye a typical trachoma developed which it took two years of constant treatment to cure; vision at one time being reduced to 20/70. Equally convincing is the case of the writer's office boy who, through a mistake, was inoculated with the discharge from an acute trachoma. On the seventh day thereafter he developed the same disease in a perfectly characteristic form.

Cases of monocular trachoma are sometimes cited as evidence against the contagiousness of the affection. To dismiss these with the assertion that they require no more explanation than the one-sided cases of gonorrhoeal conjunctivitis is hardly fair, for gonorrhoea of the conjunctiva is seldom contagious for more than a week or so and hence gives nothing like the chance for infection of the second eye which is afforded by a chronic trachoma. These cases may generally be explained in one of two ways: either the patient has taken particular pains to avoid infecting the second eye, and that such pains may be effectual the writer knows from experience with his own and a number of other cases, or the disease was really binocular at one time, but for some reason has run a light and rapid course in one eye, persisting in the other. These rapid spontaneous cures are not common, but they certainly do occur at times, in one or both eyes. With the exception of the cases in which the disease has been observed from the start and has purposely been kept from the second eye, the writer has yet to see an old case of monocular trachoma in which either a history or distinct traces of previous disease could not be made out.*

The view of Fuchs that trachoma may result from gonorrhoeal infection is probably due from his having happened to see some of the cases where persons with latent trachoma having become infected with gonorrhoea present themselves with the original disease entirely masked by the new infection and as the former continues after the subsidence of the latter, the trachoma is thought to be a sequel of the gonorrhoea. The writer has seen at least one such case where, if the previous condition had not been known, such a conclusion would have seemed warranted. In this case the trachoma, far from being extinguished by the gonorrhoea, continued on its course in a worse form than ever.

With regard to the diagnosis of trachoma, as a rule, the acute and sub-acute cases are the only ones which present any difficulty; and while genuine trachoma seldom fails to be recognized, opportunities frequently offer for the opposite mistake, that of designating as trachoma something much more innocent. Without considering the frequent diagnosis of trachoma by the inexperienced, in cases of conjunctival hyperæmia and follicular catarrh, there are not infrequent cases of conjunctivitis caused by the pneumococcus and by the diplo-bacillus of Morax which clinically so closely resemble trachoma that a mistake is almost unavoidable, unless the discharge is examined microscopically. Where, in doubtful cases, the microscope has shown pneumococci or diplo-bacilli in any considerable number, the writer has never been disappointed in excluding trachoma; while if the discharge shows nothing or only a few staphylococci or xerosis bacilli the suspicion of trachoma is increased. The most difficult cases of all are those chronic cases characterized by an abundant development of follicles in the folds, with unaffected tarsi and a very slight reaction. In some of these, until the trachoma germ shall have been discovered, a certain diagnosis is impossible. The writer has seen about a dozen such cases in which neither the clinical picture, the microscopical examination, nor the course of the affection has made him feel sure whether the disease were really trachoma or extreme follicular conjunctivitis; but as the best treatment is expression in either case the patient need not suffer on account of the uncertain diagnosis.

H. G.

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*This explanation naturally rests in the assumption that a mild attack of trachoma guards against subsequent infection. To this proposition may be opposed the fact that, in relapses, trachoma often reappears in tissue from which it has in all probability been once entirely eradicated; but it is entirely possible that while the constant exposure to the germs and toxins from the still diseased parts of the membrane might break down any immunity acquired by other parts of the same sac, the same degree of immunity might be effectual in preventing the few germs, which at any one time would be conveyed to the second eye, from gaining a foot-hold there.

REPORTS OF SOCIETIES.

SECTION ON OPHTHALMOLOGY.

BRITISH MEDICAL ASSOCIATION, JULY, 1898.*

After the president (Dr. Argyll Robertson) had opened the section on ophthalmology, Professor Nuel (Liége) read a paper on the "Absorption of Aqueous Humor by the Iris." He pointed out by the aid of diagrams the presence of lymphatic channels in the iris of the dog and cat. Indian ink was injected into the vitreous of the eyes of these animals and the passage of the ink traced into canals in the iris. By staining with silver nitrate he had found canals and stomata, the canals increasing in size towards the ligamentum pectinatum. He applied the results of these experiments to the causation of glaucoma, and pointed out that iridectomy opened up the canals. Mydriatics also had the same effect, thus increasing the flow from the eye. Professor Nuel then showed lantern slides illustrative of his paper. Doctor Berry (Edinburgh) made some remarks on the result of the injection of chlorine water into the vitreous in septic cases. Professor Nuel, in reply, stated that absorption took place from the anterior surface of the iris, and this was the principal area of absorption in the eye. Doctor Reid (Glasgow) next showed some lantern specimens illustrative of reparative processes following wounds of the cornea, and specimens of intercalary cells met with in the cornea. Dr. George MacKay and Dr. J. C. Dunlop (Edinburgh) then read a paper on a "Case of Acquired Color Blindness," which came on suddenly in a patient suffering from cancer of the stomach. The patient's vision was good, media clear, refraction emmetropic, fields of vision good to hand movements, but restricted to more accurate measurement. Five months after the color blindness came on the patient died. The *post-mortem* examination revealed cancer of the pylorus and atrophy of the posterior end of the occipito-temporal convolution of the right occipital lobe, with general shrinkage of the right occipital lobe. On section the left occipital lobe was found slightly affected and the arteries and capillaries extremely thickened. Lantern specimens of the brain and arteries were

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***British Medical Journal*, July 30, Aug. 6, 1898.

then shown. Doctor Berry (Edinburgh) spoke on the difficulty of proving the existence of a color center apart from a center of form, the form sense and the color sense being closely associated. Dr. McKenzie Davidson (London) gave a demonstration on the employment of the Roentgen rays in ophthalmology. He had used them in forty-one cases of foreign body in the orbit with satisfactory results. He showed the apparatus he used, and gave a demonstration of his methods on a patient. His principle was based on getting three coördinates of a point; the three planes were formed by two knitting needles fixed on the apparatus, one vertical, the other horizontal, crossing one another, and by the photographic plate. The patient's head was fixed, the axis of his eye being parallel to the horizontal needle. A fine Crookes tube was used in two positions, 6 cm. apart, and the two plates thus obtained being afterwards placed in stereoscopic relief. A piece of lead wire was previously placed on the patient's lower lid to form a known point from which the position of the foreign body could be calculated. This was worked out by means of a separate apparatus. A number of lantern slides illustrative of the apparatus and of skiagraphs were then shown. Mr. Treacher Collins (London) showed a number of lantern slides illustrative of foreign bodies in the eye, which had been localized by Dr. McKenzie Davidson by skiagraphy, and afterwards successfully removed. He advocated the early use of the rays in all cases of suspected foreign bodies in the eye. Doctor Cargill (London) mentioned five cases in which Dr. McKenzie Davidson's method had proved of great value in deciding the presence, situation, or absence of foreign bodies. Doctor Reeve (Toronto) showed an apparatus made by Doctor Sweets (Philadelphia), and Professor McHardy (London) spoke of two cases in which skiagraphy had proved most important. Doctor Hinshelwood (Glasgow) read a paper on "Holocain," and advocated its use as an anesthetic in eye work; it acted more rapidly than cocain. Mr. Edgar Browne (Liverpool) said that he used it in all superficial operations, as it had no harmful action on the cornea. Dr. Argyll Robertson said his experience led him to consider that holocain was much inferior to cocain, but Doctor Hinshelwood said that he believed that most cases of failure were due to imperfectly prepared solutions. Dr. Leslie Buchanan (Glasgow) then showed some specimens of leuco-sarcoma of the choroid. Professor Snellen (Utrecht) gave a "Historical Review of Operative Treatment of Strabismus," from the first operation by Professor Dieffenbach in 1839 onwards. He compared the operations of von Græfe and of Priestly Smith, and described the operation he himself had adopted. He emphasized the importance of producing as little injury to surrounding tissues as possible, thus preventing subsequent cicatrisation and shortening of the muscle. He advocated removal of a portion of the tendon in many cases. Chloroform should not be used, but a local anesthetic, as cocain. A discussion ensued, in the course of which Doctor Little said that he did not fully correct the squint at the time of operation. At the same time he laid stress upon the importance of the use of glasses, especially in young children. Doctor Berry said he believed that cases of insufficiency after tenotomy were due to too free divisions to a less extent the following cicatricial contraction might be a cause. Dr. Argyll Robertson drew attention to Mr. Critchett's operation in cases where divergence had resulted from previous operation. Professor Snellen replied, advocating the use of glasses, and the undesirability of any operation in very young children. Mr. Lawford read a paper on the "Operative Procedure for Cases of Incarcerated Iris." This consisted in passing a Græfe's knife through the margin of the cornea into the anterior chamber and out at the opposite side. He then divided the iris on each side of the adhesion. Dr. Argyll Robertson preferred operating twice. Professor Snellen said he considered the principal object of operating was to reduce tension. He performed sphincterotomy instead of iridectomy. Doctor Berry though that in the majority the tension was not increased. He did an iridectomy opposite the scar, or a double iridectomy on each side of the adhesion. Doctor Little performed iridectomy as for glaucoma in all bad cases. Mr. Lawford, in reply, expressed the opinion that the reduction of intraocular tension was the most important point. Mr. R. Williams then read a paper on a case of "Paralysis of Accommodation After Influenza." Each eye was affected, the left first. Dr. Argyll Robertson said he had seen two similar cases which followed influenza, but he could not say that influenza had been the cause. Mr. Juler mentioned cases of paralysis of the third nerve after influenza with complete recovery, and Dr. George Mackay several cases of unilateral paralysis of accommodation after influenza. One case was very persistent, but was temporarily relieved by eserin. Mr. Edgar Browne said that paralysis of the third nerve after influenza was less rare than paralysis of the sixth and the optic nerve. Mr. Granger spoke of a patient who had not recovered from the paralysis. Dr. Tatham Thompson read a paper on a case of "Cyst of the Hyaline Canal Producing a Double Lens," and Dr. Angus McGillivray read a paper on the "Hyaloid Canal and its Relation to Cyclitic Exudation." A paper on the "Diplo-bacillus and the Conjunctivitis it Caused" was read by Dr. J. W. Eyre, and on the "Bacteriology of the

Normal Conjunctival Sac and its Bearing on the Use of Antiseptics" by Mr. Arnold Lawson. He found many sacs free from organisms; out of 159 cases, 118 contained the bacillus xerosis. The pyogenic cocci were few, and when injected into the conjunctival sacs of guinea pigs produced no reaction. He advocated asepsis. Doctor Eyre considered that the upper portion of the conjunctival sac was sterile, the lower not so. Mr. Juler (London) read a paper on a case of "Symmetrical Gumma of the Ciliary Body with Recovery of Vision," and reviewed the literature, pointing out the rarity of intraocular syphiloma. Dr. Argyll Robertson said he had seen a number of cases in which the astigmatism produced had subsequently almost entirely disappeared, and Mr. Hill Griffith said he had seen vision entirely destroyed in several cases. Mr. Juler read the second part of his paper on a "Case of Interstitial Keratitis with Acquired Syphilis." Doctor Hinshelwood and Mr. Lawson mentioned similar cases, and Dr. Argyll Robertson said he thought a distinction should be drawn between the characteristic cases of interstitial keratitis and cases of keratitis punctata. He considered that Mr. Juler's case belonged to the latter category. Papers were also read by Mr. J. Fallows, Mr. H. E. Jones, Mr. Charles Wray, Mr. John Griffith (London) and Dr. Adolph Bronner (Bradford). Doctor McGillivray said that in America a solution of extract of suprarenal capsule had been used with cocain to prolong anesthesia. He had tried it in one case with good results. Doctor Reeve (Toronto) said that suprarenal extract acted as a styptic as well, and rendered the operation a bloodless one.

ACCORDING to Dr. A. Darrier, continued experiments have confirmed the observations made previously, that protargol is entirely without caustic or corrosive action, and that no danger need be apprehended from the use of too concentrated solutions. Instillations of protargol-solutions are scarcely felt, and at the most, only a slight burning is felt a few minutes after application, which is readily borne even by the most sensitive of children. Even the slight pain felt may be entirely neutralized by combining with the remedy an anesthetic. For instillations the author uses a 5 per cent. solution; as a paint, a 20 to 50 per cent. solution is used. Neisser also has called special attention to the very slight irritating effects of protargol, in consequence of which a more prolonged therapeutic effect may be readily obtained by means of it than is possible with other silver salts. The penetrative power seems also to be much greater than with other silver preparations.

REVIEW.

Concerning the Occurrence of Micro-Organisms Resembling Diphtheria Bacilli (Xerosis Bacilli, Segmented Bacilli en Massue, etc.), in the Human Conjunctival Sac, Especially the Normal Conjunctiva, Together with a Contribution Regarding the Early Diagnosis of Diphtheria. By Dr. Hans Heinersdorff. *Archiv für Ophthalmologie*, Vol. XLVI, Part 1.—The current number of the *Archives* contains an interesting paper by Professor Schoeler's assistant, the intention of which is well explained by its title. The author insists that a sufficient bacteriological knowledge of the conjunctiva is essential before any great advances can be made in its pathology, and before any sound conclusions can be drawn concerning certain micro-organisms and their relations to existing disease. Although the literature is very large, positive and well recognized results have not yet been attained. While on one hand many workers consider the conjunctiva as always being more or less the subject of infection, Gelpke and his followers believe it to be nearly or quite sterile. It is therefore not surprising that a lack of agreement exists regarding the organisms usually found in the conjunctival sac, and that the opinions regarding the presence of the Xerosis Bacillus and its allied forms upon the sound or the diseased conjunctiva should be so different. Kuschbert, Neisser and Leber described morphologically and culturally a bacillus which had been noticed in the epithelial cells of Keratomalacia and Xerosis which they then considered as the cause of Xerosis conjunctivæ. In 1883 Schleich and Sattler brought up the question of its pathogeny at the Heidelberg Congress, insomuch as this bacillus has been noticed upon both the sound conjunctiva and during slight inflammations of the same; and although it had been found pretty regularly from time to time in certain mild forms of conjunctivitis, and was supposed to bear some causal relation to them, it was not till 1890 that Baumgarten stated that he considered the Xerosis bacillus, so-called, as nothing more than a harmless parasite in the conjunctival secretion. A few years ago Deyl described bacilli, which he supposed to cause the Chalazion, but which bore a striking resemblance to the Xerosis bacillus both morphologically and by their behaviour in cultures, and lately Gelpke has described a segmented bacillus, which, however, has not been identified as the

Xerosis bacillus beyond all doubt. Eyre considers the Xerosis bacillus as a debilitated diphtheria bacillus, but has never seen it on the sound conjunctiva, and Peters thinks that it may be of significance in slight pseudo-membrane formation. Different observers have noticed this bacillus not only in the Xerotic processes but in other conjunctival diseases and on the sound conjunctiva. The clubbed contamination of Weeks' cultures closely resembles it, and Koch, who with Kartulis studied an epidemic raging in Egypt, described a bacillus which was very similar to it, but possessed some differences, and which is now known as the Koch-Weeks bacillus.

Gayet examined the conjunctival sac of 213 cataract patients, in which he found that 80 contained micro-organisms, mostly cocci, but few bacilli. Schmidt found in the trachoma secretion a form resembling the subtilis, and also a short thick rod with swollen ends. Cazalis described a bacillus *en massue*, which he found during his trachoma investigations growing upon blood serum, and which looked like the Xerosis bacillus. Axenfeld found it frequently associated with the Pneumococci and Diplobacilli, and often found it in Phlyctenular conjunctivitis, and considers it merely a harmless parasite present in over half of sound eyes. Conclusions to be drawn from data hitherto obtainable as regards the presence of the Xerosis bacillus upon the healthy conjunctiva, Fick's recent work on the subject being alone excepted, are unsatisfactory. Gifford did not notice any organisms resembling it in 25 normal conjunctival sacks. Weeks does not mention finding anything like it in the tears of 120 children and 35 cataract patients. Franke examined 130 conjunctivæ, of which 115 were normal, and found 32 germ free, and only one which contained the Xerosis bacillus. Gombert, Axenfeld and others have not found it in normal cases. On the other hand, Schauz and others considered it an ordinary dweller upon the normal conjunctiva; consequently in view of this diversity of opinion the author undertook to determine whether the normal sac was germ free as stated by Gelpke, and whether his Bacillus septatus was really the cause of acute contagious conjunctivitis, and never found in the healthy sac.

Fifty-one persons were examined, and blood serum was exceptionally used. In differentiating those bacilli, which resemble the genuine diphtheria bacillus, attention must be paid to the following points: The changing size of the rods, swelling of the ends, end staining, tendency to segmentation, club formation, rosette-like groupings, frequent negative results or tardy growth on gelatine at the temperature of the room, non-liquefaction, formation of pap-like or finely granular deposit in the otherwise clear bouillon, not too luxuriant a growth on blood serum, less on agar in slightly prominent colonies, non-pathogenic to guinea pigs. In this class, besides the Xerosis bacillus, is included also the Bacillus duplex, Luftstäbchen, Bacillus septatus, the Bacillus granulosum of Lachowicz, the Chalzion bacillus of Deyl, and the Bacillus *en massue* of the French, all of which bear the title Pseudo-diphtheritic bacillus. This term might create some confusion, since by it is generally understood Hofmann's Pseudo-diphtheritic bacillus of the throat, which, however, is not identical with the often, so-called, Pseudo-diphtheritic bacillus of the conjunctiva. Fränkel finds many differences between it and the conjunctival form, i. e., the Xerosis bacillus. Hofmann's variety grows upon better glycerine-agar than even the genuine diphtheria or the Xerosis bacillus, and it thrives preferably upon gelatine upon which the Xerosis does not grow so well, and it is rarely found upon the conjunctiva. Therefore these pseudo-bacilli of the conjunctiva may in a general way be divided into two great classes: One, the more widely distributed and almost constantly found on the normal conjunctiva, and which does not thrive upon gelatine and potato; the other, less common, which grows more luxuriantly, and which stands more closely to Hofmann's. Of the fifty-one persons examined the tubes were sterile in only two instances, which, however, only goes to prove that the tears used for inoculation contained no micro-organisms; cocci, usually the albus, were the more prevalent, and they were not pathogenic. The typical Xerosis bacillus was found forty-one times, and only three times were other rods found. In 10 normal conjunctivæ examined by Axenfeld Xerosis bacilli were found every time, and in 364 cases varying in severity Uhthoff and Axenfeld found the Xerosis bacillus 88 times. A closely related bacillus has been found in ophthalmia neonatorum. The Xerosis bacillus has not been found early in corneal processes due to Pneumococci or Diplobacilli on account of the more luxuriant growth of the latter, and to meet this condition the medium selected must be more favorable to the Xerosis. The author therefore believes that the Xerosis bacillus represents a group resembling the Diphtheria bacillus, and as a harmless parasite is constantly present in the normal conjunctival sac and in a variety of conjunctival diseases; he also believes it to be constantly present in the Koch-Weeks conjunctivitis. Gelpke, on the contrary, considers most conjunctivæ as being in an abnormal state, and that the results may have been obtained through unusual activity of the inoculating material or the peculiar nature or the culture medium.

Most of the investigators have used Bouillon-peptone agar or glycerine agar as being the best suited for the work, and Gelpke, especially, in his investigations regarding acute contagious conjunctivitis, and upon the normal conjunctiva, although at first he did use blood serum. Fränkel and Franke prefer the agar preparation, while Baumgarten, Axenfeld and Morax favor blood serum. Upon comparing the growths upon these media it was found that the Xerosis bacillus as a rule grew rather better on blood serum, although negative results might in some cases be ascribed to tardy growth. While upon blood serum the colonies presented the usual appearances after twenty-four hours, the glycerine agar grown bacilli were scanty short rods, appearing like cocci, and well calculated to deceive, but when these were carried over to blood serum the rods lengthened out, presenting a clubbed and segmented appearance; the plasma spaces of Gelpke were likewise noticed. As opposed to Fränkel and Franke, who observed the segmentation and club formation principally upon agar, and who considered it merely a degeneration, the author finds that, when blood serum is used, there are even greater variations morphologically, and he therefore considers the results of his observations as agreeing with Gelpke's description of the Bacillus septatus. If Fick and Leber, who did not use pure cultures, and Monti, who described something else, and Neisser, whose bacillus had some distinguishing characteristics, are ruled out, the descriptions of the other investigators are essentially in harmony, the morphological differences being due to the kind of media employed. At all events there seems to be no good reason for ascribing especial morphological peculiarities to the Bacillus septatus and the giving of a new name to an old acquaintance. The author therefore concludes that the Xerosis bacillus is constantly present in acute contagious conjunctivitis, which it does not cause, and that the Deyl Chalazion bacillus is nothing else than a variety of the Xerosis bacillus, and simply a harmless parasite of the conjunctiva. Genuine Lœffler bacilli have been found present in large numbers in croupous conjunctivitis, and likewise a non-virulent form, the Xerosis bacillus. True diphtheritic bacilli have been found associated with mild attacks of conjunctivitis, and even in the normal sac, and they have been found, still retaining active properties, upon a conjunctiva, which, after passing through an attack of diphtheria, has become sound again. In other instances have been found bacilli after the disease had run its course, which, although morphologically and culturally resemble the genuine, now are non-virulent. This has practical bearing as regards when to apply constitutional treatment and serum therapy for a local condition which may result fatally by the local process becoming constitutional and general. As is well known experts do not agree upon the question of identity. There are many who regard the Xerosis bacillus as a degenerate or non-virulent diphtheria bacillus, others consider them as identical, but with different degrees of virulence. Spronk has quite recently stated that he thought that he could detect a difference in that he got no effect in guinea pigs with genuine diphtheria bacilli after a preliminary serum treatment, while, on the other hand, after using the Xerosis bacillus under similar conditions, he thought he noticed a localized swelling at the point of inoculation. The majority of observers unite in believing that the differences noticed morphologically and in the culture tube are too slight and uncertain to offer a basis for therapeutics. Again, their behaviour towards weak alkaline bouillon was thought to offer a means for differentiation, the genuine bacilli causing the reaction to become acid after two or three days, while the Xerosis bacillus increased the alkalinity, still Fränkel and others combat this, and claim to have observed an acid reaction with non-virulent bacilli. The only absolute proof is the positive knowledge obtained by inoculation experiments on animals. Recently Neisser has announced a ready method of differentiation of the genuine from the pseudo-bacillus based upon their behaviour toward stains. He makes use of a double stain of Methylen blue and Bismark brown, and obtains delicately colored rods, long and slender, which have a granule at either end, and sometimes another in the middle. Very characteristic are the obtuse angled bacilli, with their two or three granules slightly oval, and if at the ends of the rod seem to make the diameter greater than a cross section of the bacillus. To compare the behaviour of similarly aged Diphtheria and Xerosis bacilli the author undertook a series of experiments, and finds it rather difficult to decide between the two by means of stains. He, however, offers the following: If the double stain shows the typical rod and granule in cultures from nine to ten hours old, they may be considered as virulent diphtheria bacilli. No granule formation is noticed in Xerosis bacilli of the same age, but after twenty-four hours granules may appear, without, however, the typical relation or appearance of the granule to the rod. This refers in general to fresh cultures. As the age of the culture influences the result it is well to stain and examine not later than sixteen hours, for after that an occasional Xerosis bacillus is noticed. Use serum in all cases giving a successful stain. The difficulty of the method must not be lost sight of, and it is well to bear in mind that the success to the stain stands in close relation to the energy of the growth of the bacillus, and this again depends upon the quality of the culture medium. A very complete bibliography and some excellent plates accompany the monograph. WM. DUDLEY HALL.

THE ETIOLOGY AND EDUCATIVE TREATMENT OF CONVERGENT STRABISMUS. BY PRIESTLEY SMITH, M.R.C.S., *British Med. Journal, July 2, 1898.*—For the cure of strabismus measures of three kinds are employed at the present day—optical, operative, and what may be called educative, the aim of the latter being to lead the patient not merely to direct his eyes, but to use them in the normal way. Concerning the value of glasses and operation we are all practically agreed. The educative treatment, that is, the systematic use of the monocular shade, the reading bar, the stereoscope, and so forth, stands on a different footing. Javal,[1] who has been its chief exponent for many years, and has elaborated it with infinite ingenuity, declares that it is not only an important auxiliary before and after operation, but is capable by itself of curing certain cases. Many others have used it to a certain extent, but there is no general agreement as to its value; indeed, one well-known writer goes so far as to doubt whether the cases which have been cured by it would not have got well without it, and whether those which are incurable without it are ever curable with it. The present investigation was undertaken in order to ascertain the value of this line of treatment, and to test the principles on which it is based.

METHOD OF INVESTIGATION.—Since January 1, 1897, all cases of concomitant convergent strabismus coming under my care were examined on a uniform system, and noted on special printed forms. The following points were noted, so far as possible: Age; onset age; circumstances of onset; nature of squint, whether periodic or continuous, and whether alternating or monolateral; angle of squint; fixation power of squinting eye, whether true or false; refraction under atropine; acuteness of vision with corrected refraction. So far the methods of examination need not be described in detail. Beyond this there were certain tests, employed chiefly in the later stages, which require explanation.

Potential Fusion.—The squinter, looking at an object such as a lighted candle, sees it single rather than double, because he has learned to take no notice of the image formed in the squinting eye. Will he be able to perceive both images simultaneously and to fuse them if we succeed in putting his eyes approximately straight? The only way in which we can test the point beforehand is by taking two similar objects, and placing them so that while the straight eye fixes the one, the squinting eye fixes the other, and so that each eye can only see its own object, as in the stereoscope. The small instrument which for convenience I will call the "fusion tubes,"[2] is essentially a miniature stereoscope, admitting of free adjustment for abnormal positions of the eyes. Looking through the tubes as through an opera glass, I see with each eye a white hole and a coloured hole, the colour being red for the one eye, green for the other. Placing the tubes in a parallel position I see the two white holes as one, for the two images are fused. Now the squinter who at first sees four holes—two white, one red, and one green—and then by converging the tubes blends the two whites while he continues to see the red and the green, has, we may assume, a potential faculty of fusion, although under ordinary circumstances he is unable to exercise it, and does not perceive the two images of one object.

Fusion Limits.—Assuming that the patient is able to fuse the two images when the tubes stand at a certain angle of convergence, can he vary that angle and still fuse them? Can he voluntarily abduct or adduct his eyes in the interest of binocular vision, and if so within what limits? For the purpose of accurate measurement I have placed the tubes in a frame which supplies fixed points of rotation, with scales showing their angular movement. The white holes, moreover, are replaced by vertical slits, so that fusion may still be attainable even though the deviation of the eye be vertical as well as horizontal. Fusion having been obtained, we move one or other tube slowly inwards and outwards, and note the point in each direction at which fusion ceases and the lines become double. For want of a better name I have called the instrument a "heteroscope"[3]—an instrument with which a deviating eye sees.

Angle of Equilibrium.—In certain cases which appear to be nearly or completely cured we want to know the position which the eyes tend to assume when the stimulus of fusion is withdrawn. Turning an internal shutter in each tube of the heteroscope, we cut off the upper part of one slit, the lower part of the other. Fusion of the slits is now no longer possible. We tell the patient to place the tubes so that the one white line stands vertically over the other, and thus ascertain his angle of equilibrium.

Actual Fusion: Binocular Vision of a Single Object.—A completely satisfactory test of this point is difficult to find, and the more so because binocular vision is a faculty which presents various degrees of perfection. I adopted as the initial test for actual fusion the principle of Snellen's coloured glasses and coloured letters: Spectacles carrying red and blue glasses in a reversible frame are placed on the patient's face in front of his own glasses. Cards bearing red, white and blue discs and letters on a black ground are shown to him. He must count the discs or read the letters, special precautions as to light and other matters being taken to avoid fallacy. The patient who has recovered the power of fusion will see the whole, while he who uses one eye and suppresses the vision of the other will see only those discs or letters corresponding in colour to the glass through which the good eye looks.

For the sense of perspective—the higher development of binocular vision which is learned by the continued practice of fusion—I used Hering's drop test.[4]

Etiology and Course of the Disorder.—*The Early Age of Onset* is the most conspicuous fact in the etiology of convergent strabismus. (Table I,) I do not attach a precise value to the figures here given, but I lay stress on the fact that the disorder commonly begins at a time of life when the visual apparatus has not reached completion in structure or function. The development of the visual powers in infancy demands especial consideration.

Table I.—*261 Cases of Convergent Strabismus. Onset Age in General and in relation to True and False Fixation.*

Age: years	0	1	2	3	4	5	6	7	8	9	10	11	12 and over.	Totals.
All cases	16	31	38	63	35	36	9	11	8	6	2	1	5	261
True fixation	13	17	26	50	27	31	8	11	8	6	2	1	5	205
False fixation	3	14	12	13	8	5	1	—	—	—	—	—	—	56

The much-debated question whether the co-ordination of eye movements represents innate structure or acquired habit cannot be dogmatically answered. It is one of degree. Co-ordination is both innate and acquired, and variously so for different organs and different animals. The chick picks up grains of food within a few hours of leaving the egg, and after a few false shots strikes them with precision. Here the co-ordinating mechanism is complete, or nearly so, before it is used. The human infant is far behind the chick in this respect. His first eye movements, though already co-ordinated automatically for bilateral action, are purposeless, like the first movements of the limbs.[5] They have no relation to external objects. They represent activity in the lower levels or centres of the brain, uncontrolled by perception in the higher.[6] The higher levels are still undeveloped. His vision at birth is a mere perception of light. Soon he begins to notice conspicuous objects, then to recognize and follow them, and by the end of twelve months he watches all that goes on in his neighbourhood. We cannot test his vision at this age, but it is certainly not yet acute. He will pay no heed to minute objects. Even when he is old enough to learn his letters these must at first be large, and, unless I am mistaken, even when he is able to name them all he will still for a time be found unable to recognize Snellen's No. 6 at 6 metres. During these early years, too, his refraction alters.

Beginning with a considerable hypermetropia, like a lower animal, he gradually approaches emmetropia, but at 6 years of age has usually some hypermetropia still.[7] The visual apparatus with which the infant comes into the world is rudimentary; it is elaborated by use; the fine adjustments are made by practice and observation. The onset of strabismus in a young child involves an interruption and even a reversal of this process. What are the conditions which induce it?

Hypermetropia.—Grades of hypermetropia, which are exceptional among people in general, even in early life, are prevalent among those who squint (Table II).

TABLE II.—*310 Cases of Convergent Strabismus Refraction under Atropin.*

	No. of Cases.	Per Cent.	
M.	3	1	
E. to H. 1.5 D.	34	11	
H. 2.0 to 3.5 D.	106	34	88
H. 4.0 to 5.5 D.	122	39	
H. 6.0 and over.	45	15	
	310	100	

They predispose to strabismus, or actually induce it in certain cases; but the influence of hypermetropia as an essential cause has been overrated. In regarding statistics, we must remember that hypermetropia (under atropine) prevails not only among squinting children, but among non-squinting children also.[8] We must remember, too, that a considerable contingent of squinters have little or no hypermetropia, and that the vast majority of hypermetropes have no squint. The doctrine of Donders by reason of its great importance, has dominated some of us too exclusively.

The angle of the squint is not proportionate to the hypermetropia. A given effort of accommodation corresponds, in the emmetrope, with a given angle of convergence. The ordinary hypermetrope acquires the habit of converging normally, although he accommodates abnormally. The exceptional hypermetrope who fails to acquire this habit and squints instead, presents a deviation which is greatly in excess of that which his hypermetropia would seem to require.

What is the explanation of this excessive deviation? The view that it is a voluntary and purposive act for the more complete avoidance of diplopia is not altogether satisfactory, for if the extra deviation were maintained by an effort of the will, it would surely be abandoned to some extent when the squinting eye was covered, and would hardly occur at all when the squinting eye is comparatively useless, whereas it is sometimes these useless eyes that squint the most. Is it not rather the overaction of a motor centre which has escaped from conscious control? The maintenance of fusion depends on brain action of a complex nature, on lower centres which act, when uncontrolled, without regard to purpose, and higher centres which control them. In strabismus we have probably not only exhaustion of the controlling centres, but loss of the perception which should guide the eye. The sense of fusion falls into abeyance not by the mere withdrawal of one image, as when the eye is covered by the hand, but by a purposive inhibition or suppression of it. This suppression confirms the loss of control, and degrades the act of convergence to a purely automatic level.

Failure of Control.—The onset of strabismus is often attributed to a fit, a fright, a fall, or other such occurrence, and still more often to an illness, such as whooping cough or measles. Making allowance for the frequency of such events among children, and for a certain disregard of time and sequence in their elders, it seems to me highly probable that these supposed causes are often real causes. Some such explanation of the onset was given, with show of reason, in more than two-fifths of my cases, and the proportion would no doubt have been higher had not many of the patients been brought by persons who knew nothing of their antecedents. In many cases the history was definite, and not to be upset by cross-examination. For example: A child who had never been seen to squint before came from school squinting badly, having that morning been put into a corner with a cloth over her head. Another did the same immediately after having his head pushed into a bucket of water by his brother; another after sitting in scalding water; another after being terrified by a monkey which jumped onto her shoulder. No less clear in many cases was the history of onset during measles, whooping-cough or other constitutional disorder. All these are conditions which may gravely disturb the nervous system. Shock, anger or apprehension impair the control of muscular action. Febrile disorders cause delirium, convulsions and sometimes transient strabismus, and leave the nervous energy exhausted. Is it not highly probable that such disorders occurring in young children may interrupt the action of those higher centres which control the movements of the eyes, and this not only where control is already difficult by reason of amblyopia or error of refraction, but even in children whose visual apparatus is normal for their time of life, but not yet fully developed?

Inequality of vision of the two eyes lessens the value of binocular vision, and increases the difficulty of maintaining it. It is present in a large majority of cases. In less than 5 per cent. of my cases there was some opacity of the media. In about 50 per cent. there was a decided inequality of refraction. But apart from these causes there was an inequality of vision not removable by correction of the refraction in 78 per cent. of all the cases in which vision could be tested; slight in some, but considerable in a large number. In 23 per cent. of all my cases the squinting eye had lost the power of true fixation.

The amblyopia of the squinting eye: is it a cause or a consequence of the squint? There is little evidence to show that an eye which has once acquired good vision can lose it through squinting, but remembering how transient are the impressions received at 1, 2, or even 3 years of age—how a familiar face not seen again is absolutely forgotten—a language partly learned but not used later entirely lost—we may suspect that an eye which begins to squint before the development of vision is completed may lose something of what it has acquired. The loss of fixation power by an eye which has once possessed it is almost a proof of loss of visual power. Some of the amblyopia, however, is certainly antecedent to the squint, for many squinting children are amblyopic in both eyes, and it is clear that the defect in the fixing eye is not dependent on the squint. Seeing, then, that both eyes often fail to reach the normal standard of vision, we may reasonably suppose that the failure is sometimes unequal in the two, or even confined to one, and therefore that the amblyopia precedes the squint, and plays a part in causing it; indeed, no other view is possible where we find great inferiority in the squinting eye shortly after the onset of the squint.

But to speak of the amblyopia of squint simply as a congenital defect is misleading. All eyes are highly amblyopic at birth. Those which later reach the standard of normal vision do so by a process which occupies several years. If strabismus be established before this process is complete the further visual progress of the squinting eye is likely to be hindered, if not arrested.[9] The cases which present the greatest amblyopia seem on the whole to be those of unusually early onset. Among cases beginning during the first three years of life a much larger proportion had false fixation than amongst those beginning later (see Table I). That some beginning even in the first year retained true fixation may have been owing to the squint being alternate or remaining periodic till a later age. Moreover, the results of disuse would vary not only with the actual age of onset, but with the state of development at that age. Many squinting and amblyopic children are distinctly backward. It may be that highly amblyopic eyes squint earlier than others because they are amblyopic, but we ought not to leave out of consideration the possibility that the early onset of squint may arrest the visual development of the eye.

Course of the Disorder.—At first the squint is usually periodic, coming and going with accommodative effort, but each lapse tends to facilitate recurrence, and in time, as the suppression of the deviating image becomes confirmed, the squint becomes continuous. It is unfortunate that so few of these children come under treatment in the periodic stage—16 per cent. in my experience—for it is then, as a rule, that the squint is cured most easily. Both in the periodic and in the continuous stage the large majority of squints are monolateral; in my cases 81 per cent. The alternating squints, constituting 19 per cent., were characterized, with few exceptions, by nearly equal refraction, and nearly equal vision in the two eyes. But the two groups are not absolutely separable. In the continuous stage, whether the squint be alternating or monolateral, the suppression of the deviating image becomes more and more complete, and the act of convergence becomes more and more dissociated from visual perception. Thus, when tested with the heteroscope, most squinters can see with the two eyes simultaneously. Some can fuse when the tubes stand in a particular position, but cannot maintain the fusion when the tubes are abducted or adducted from this position by a single degree. They have lost the notion of making a voluntary effort for the avoidance of diplopia. Some have no sense of fusion, or fuse in a spurious fashion, placing the tubes so as to blend a macular picture in the one eye with an eccentric picture in the other, according to ingrained habit. This we might expect where the squinting eye has lost fixation power, but it is surprising when met with in a patient who has normal vision in both eyes, as in some cases of alternate squint. The alternate squinter is an expert in the arts of suppression and so-called false projection. He fixes his object with either eye at will. In the other eye at the same moment, he suppresses the macular picture which he does not want, and develops to some extent the misplaced image of the object looked at, projecting it not falsely but truly, in spite of the false position of the eye.

These secondary perversions of the visual function are at once consequences of the squint and causes of its perpetuation.

Summary of Etiology and Course.—1. Convergent strabismus is a disorder of innervation in which the visual centres fail to control the act of convergence. This act is thereby degraded. It becomes purely automatic and purposeless. It is excited by the associated act of accommodation. It is excessive because it is uncontrolled.

2. The failure of control depends largely on faulty development of the visual apparatus. The fault, whether it be in the eye or in the central organs, is frequently hereditary. In many cases the power of control is lost through shock or illness during infancy.

3. Hypermetropia, when of considerable degree, predisposes to strabismus, and sometimes causes it, by demanding an abnormal effort of control, but hypermetropia of low degree does not account for strabismus in a child.

4. The disorder is confirmed and perpetuated by suppression of the function of the squinting eye. In treating it we should aim at stopping this habit of suppression, and establishing the habit of binocular control.

Educative Treatment.—In the present series of cases educative measures were employed to a considerable extent, but hardly ever alone; always, or almost always, as auxiliaries to operation and the use of glasses. Moreover, treatment was often incomplete, being abandoned or neglected by reason of time, trouble, or expense, so that the results in mass are no true measure of the curability of the disorder. Again, I have no standard of results obtained in other ways with which to compare the present. It is clear, therefore, that the question at issue cannot be answered by a mere appeal to figures. Still some numerical statement may be useful. I take for analysis 251 cases which came under treatment during the year 1897. During the last few months I have endeavored to examine the whole of this series, and am able to say something as to the present state of just 200.

Fifty-seven had binocular vision of a certain kind; they appeared under the red, white, and blue test to fuse both in near and in distant vision.

Separating the periodic from the continuous squints, I find that 59 per cent. of the former and 18 per cent. of the latter had recovered in this way.

Eleven others fused in near vision, and were not tested for distant vision, the importance of this having for a time escaped my notice.

Nine others almost certainly had binocular vision, but were too young for the actual test.

Twenty-two more fused in near vision, but used one eye only in distant vision. In these latter cases it was most interesting to observe how the child, when standing say at 3 feet from the card, would see the three dots at once, and then, on taking one step backward, being unable to diminish the angle of convergence sufficiently for that distance, would instantly suppress the use of one eye, and see two dots only.

In the remainder—that is, in just about one-half the cases of known result—binocular vision was absent both in near and distant vision. This latter group included many patients who were cured as regarded appearance. It naturally included most of those who had false fixation at the outset, and many in which the treatment had been abandoned or interrupted.

These figures relate to fusion merely—that is, binocular vision of an elementary kind—not to the fully-developed sense of perspective or solidity. This latter was recovered in 16 cases, as proved by the drop test, and probably in others, for the test was not applied to all who had recovered fusion. The results, no doubt, are not all final. Some of these patients have the faculty of fusion on uncertain tenure, and may lose it in the future, especially if they are careless as to using their glasses. On the other hand, some who have it not will probably still acquire it, and those who retain it will certainly develop it more fully. Those especially who have it now in near but not in distant vision are likely to extend it to the latter also.

The means employed were of three kinds—occlusion of the eye by means of a shade or pad, bar-reading, and the use of the fusion tubes, these being intended as a simple substitute for the stereoscope.

The shade was employed, with more or less persistence, in 118 of the 251 cases. Its purpose is not so much to give the squinting eye a greater acuteness of vision as to compel it to use such vision as it has to promote fixation and to prevent or stop the habit of suppression. There is a period when the faculty of fixation can be saved or lost.

In January, 1897, I saw a child of 18 months with periodic squint of short duration in the left eye. The eye fixed the mirror readily as shown by the corneal reflex. Both eyes under atropine had H. 3 D. I ordered a shade to the good eye, and should probably have given glasses later, but the treatment was neglected. Fifteen months later I saw the child again, and found a continuous squint with false fixation. In contrast with this my records show 7 cases which at first had false fixation, but recovered true fixation under treatment. In every instance the recovery was aided by the wearing of correcting glasses, but it would not have come about without occlusion of the fixing eye, for it was attained before the squint was got rid of; so that without compulsion the squinting eye would never have fixed at all.

False fixation, then, though usually incurable by any reasonable amount of effort, is not always so; and in young children especially we ought to give the eye the chance. In the more hopeful and larger class where the squinting eye has still the power of true fixation, the shade is often of distinct advantage. At first the child rebels; endeavors to remove the shade or to look sidewise from behind it; failing this, it is awkward in guiding itself, is apt to fall, is unable to put its finger smartly on a given spot; in short, has false projection through using its sight in an unwonted way. Soon, however, these difficulties begin to disappear; the shade is tolerated; the mother assures us that the child can use the eye much better, or perhaps complains that we have driven the squint into the other eye. The eye has become more useful through being used. In my series I find 10 cases which, at first monolateral, showed a tendency to alternate after persistent occlusion of the fixing eye. Such advantage, no doubt, is transient if we stop the shade and proceed no further, but when we follow it up by operation it helps unquestionably in the recovery of fusion. During treatment, the vision of the squinting eye as measured by Snellen's letters rose a little in many of my cases, greatly in a few.

Some of this improvement may have been due to the continued wearing of a proper glass, for eyes which have no squint frequently show a gradual betterment of vision during the few months following the correction of refractive errors. In one case, however, vision rose from $\frac{6}{60}$ths to $\frac{6}{12}$ths, though the same glasses were worn throughout, and had been worn for some years when the case came under treatment. In this case, together with the use of the shade, a large divergence, due to operation 8 years earlier, was corrected.

For stopping the habit of suppression the shade is invaluable. When glasses, or glasses and operation, have brought the squinting eye into fairly good position, there often remains a trifling squint which the patient makes no effort to correct. He cannot, for he is not conscious of the displaced image. By covering the fixing eye for a time we may arouse the dormant vision of the other, and he may then be able to perceive the two images at once, and to unite them by adjusting the position of the eyes. To cure the habit of suppression, the shade must for a time be worn constantly on one eye or the other: on the good eye as much as possible, and at other times on the bad one, for the squinting eye had better be in darkness than continue to form images which the brain does not perceive. Occlusion of the good eye for a certain time each day may suffice to prevent a young child from losing the faculty of fixation, but it will not banish the habit of suppression. I have usually attempted to occlude the eye by means of the ordinary celluloid shade with an elastic cord, placing the shade beneath the spectacles, but this is sometimes difficult to manage. A pad of cotton wool held in position by the spectacles often answers better.

Bar-reading, the *lecture controlée* of Javal, was employed in thirty-one cases. A bar of some kind, such as a paper-knife, a ruler, or a strip of card, is held between the eyes and the book in such a way as to hide a part of each line from each eye respectively. The patient's own forefinger will answer the purpose if held properly, and has the advantage of being always at hand. The most convenient implement, I think, is a thin strip of metal, bent in two places at a right angle so that it can be held upon the book with a thumb or finger. It is steady in relation to the book, and can be moved easily up and down the page. The patient must be taught how to use it. When his fixing eye reaches that portion of the line which is hidden from it by the bar, he must use his other eye. There must be no guessing, and no dodging movement of the head or book. At first the bar will block the line completely. To show him that the other eye can help him out if he will make it work, we cover the fixing eye for a moment with a screen. Next we teach him to occlude it for himself, at first perhaps with his hand, but as soon as possible by a momentary closure of the lids. He will learn this in a day or two if not at once. Soon he will be able to travel along the line with only a slight hitch where he closes the better eye, and at last he will read smoothly keeping both eyes open. No one who has seen a patient work his way through these several stages can doubt that bar-reading aids in the recovery of binocular vision. It is chiefly effective when practised in conjunction with the use of the shade. Its weak side is that it is inapplicable in very early life. To older patients it affords interesting occupation.

[Cases of long-standing strabismus were cited in which treatment by glasses and operation left a slight deviation, with no diplopia and no tendency to fuse, and in which the subsequent use of the shade and reading-bar restored binocular vision in the course of three to six weeks.]

The fusion tubes were used, together with other treatment, in 21 cases. The plan was to let the patient hold them in such a way as to blend the two white holes; then to separate and join these many times in succession, so as to get the idea of fusing double images. Then to overlap them partly, and try to make them go together by looking at them. Lastly, to practice this at home. Seeing that this exercise grows easier with a little practice, I presume that it serves to stimulate the sense of fusion. It is irksome if long continued, but interesting for a while, and can sometimes be managed by children who are too young for the reading bar. With the stereoscope proper I have done nearly nothing; time failed for any sufficient trial.

The old idea that the squinting child needs a little skilful cutting and nothing more is dying out. Most people know that glasses are often necessary; but that the child may require teaching, at some trouble, to use the squinting eye is a new idea to many. But it is easily grasped, and must be grasped if our efforts are to be effective. I have used the word "educative" as a help in that direction. Of course there are parents and there are children on whom all time and trouble spent in this way are entirely thrown away, but on the whole I have been surprised at the care and patience with which directions have been carried out even in homes where one might least expect it. In this lecture I have stated only my own experience; it has been impossible to compare it with that of others. I have referred but little even to Javal, but those who know his work, especially his recent *Manuel du Strabisme*, will know how much I am indebted to it. On some points of etiology his views are, I think, open to question, but as regards the education of the visual function which he has so ably advocated, I am convinced that the principle is true and the method practically useful. Used rarely by itself, usually in conjunction with other treatment, it promotes real as distinguished from apparent cures of squint, and gives the maximum security against relapse.

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PROPRIETARY PREPARATIONS IN GERMANY.—*Die Deut. med. Woch.*, 1898, and the *Woch. f. Ther.* and *Hyg. d. Aug.*, June 9, 1898, are much exercised over a certain patent proprietary preparation called "Cornesin," which is advertised to be extracted from a rare variety of South American deep sea fish and which seems to be identical with common cod liver oil. This is alleged to cure all ills the eye is heir to. Especially is it recommended to cure cataract, at 12.50 mk. a bottle. We are not the only nostrum-ridden people in the world. The "absorption cure" of cataract has evidently gained victims abroad.

SHORT ABSTRACTS FROM OTHER JOURNALS.

STATISTICS show that Spain contains more blind people than any other nation in western Europe. The proportion is said to be 148 to every 100,000 inhabitants.

ON NOV. 2D LAST Dr. J. D. Timmerman, of Leipzig, O., officiated at the delivery of a baby that was born without eyes. In all other respects it was perfect, and when four months old he wrote us that it had grown as rapidly as any baby. This is the first case of the kind that has ever fallen within our personal knowledge.—*Med. Gleaner.*

TREATMENT OF TRACHOMA WITH IODIN. R. Roselli of Rome reports 78 patients completely cured out of 100, with nascent iodin generated by administering potassium iodide internally, and when the iodin begins to be eliminated in the lachrymal secretions, he paints the upturned lid with oxygenated water. Another method is to apply to the lid 1-15 solution of the potassium iodide and then apply the oxygenated water. The generation of iodin causes a slight smarting at first, which passes away in a few seconds to five minutes.

DIPHTHERIA OF THE EYE. McCollum, writing on "Antitoxin in the Treatment of Diphtheria" (*Boston Med. and Surg. Jour.*, for August 18th), mentions fifteen cases in which the sight would undoubtedly have been lost except for the heroic administration of antitoxin. In only one of those cases was there destruction of the organ, and this was in abnormal condition at the commencement of the attack. "When a diphtheritic membrane appears in the eye the effect of antitoxin on the membrane can be more carefully studied than when it appears in the pharynx. In some of these cases 2,000 units were given as the initial dose and this was repeated in six or eight hours, if there was not a marked improvement." Except in very young infants, he believes the initial dose should be 2,000 units, and in severe cases 4,000 units may be given; the more concentrated the better, as the possible source of danger lies in the amount of fluid, and not in the inherent property of the antitoxin.

MYDRIN, THE NEW MYDRIATIC. Dr. S. Snell writes to the London *Lancet*, July 16, saying that he desires to confirm "my observations on this mydriatic in the Clinical Journal in 1895, which were, I think, the first published in this country. I would like to add that I again refer to the value of mydrin in my volume on 'Examination of the Eye' (Pentland) published this year. My object in writing now is to reiterate my opinion of the efficacy of mydrin as a rapid pupil dilator without affecting the accommodation, and the effects of which quickly pass off, features marking it as especially adapted for producing mydriasis for ophthalmoscopic purposes. The present price of the drug is, however, almost prohibitive of its use. I understand that it still costs something like $6.25 a drachm, but of course a demand for it would soon bring about a reduction in price. It is further to be desired that some firm should furnish the drug in the form of gelatin discs."

THE HISTOPATHOLOGY OF HERPES IRIS. Dr. L. C. Pardee in the *Bulletin of the Johns Hopkins Hospital* for July reports two cases of this disease, with the results of a close study of its pathology. His report shows that the histopathology may be summarized as an acute exudative inflammation of the upper half of the conium, with dilatation of the superficial network of blood vessels and lymphatics (the latter being slight) accompanied by a considerable emigration of polynuclear leucocytes, which in one case became almost immediately disintegrated after leaving the capillaries of the papillæ. The latter, as the process extended, became practically filled with nuclear detritus, and, by the confluence of neighboring papillæ similarly affected, the vesicle was formed. This phenomenon of nuclear fragmentation does not appear to have been noted by any previous observer. In both cases the vesicle was formed by the lifting of the entire epidermis from the papillary body, the former becoming compressed over the vesicle in Case 1, and in Case 2 appearing swollen and edematous, and showing more or less dilatation of the inter-epithelial spaces and detachment of the cells of the basal layers of the epithelium. The contents of the vesicles were always the same, and consisted of coagulated serum, polynuclear and mononuclear leucocytes, occasional detached epithelial cells, strands of fibrin, and, in Case 1, much nuclear detritis. No infracts of blood-vessels and no hemorrhages were noted. The sweat apparatus, hair follicles and sebaceous glands were unaffected.

NEWS ITEMS.

Personals and items of interest should be sent to
Dr. Frank Allport, 92 State St., Chicago.

Dr. Carl Grunert has been appointed privat docent in Tubingen.

The ninth congress of teachers of the blind was recently held in Berlin.

Leipzig. Dr. O. Schwarz has been appointed Professor of Ophthalmology.

Stuttgart. Dr. A. Peters, formerly of Bonn, has been appointed Professor of Ophthalmology.

Stuttgart. Dr. Königshöfer has received the title of Professor of Ophthalmology to the University.

Breslau. Prof. Herman Cohn celebrated his 30th year of service as teacher of ophthalmology in the University on July 24th.

Dr. George F. Keiper of Lafayette, Ind., was elected vice-president of the Indiana State Medical Society at its May meeting.

According to Snailken, many of the Moors become totally blind in late middle-life, which he attributes to the excessive drinking of coffee.

Dr. John P. Davidson has been appointed Professor of Ophthalmology in the Virginia Medical College, succeeding the late Prof. C. M. Shields.

Berlin. Prof. Silex has left his position as assistant to the Ophthalmic Clinic of the University and has opened an Eye Clinic at 31 Karlstrasse.

In order to perpetuate the memory of Otto Becker a tablet is to be placed on the house in Ratzeburg, where he was born, and his bust in the hospital at Heidelberg.

There has lately been published a work on the history of early Hispano-Roman eye practice by Dr. Rudolfo del Costello, and entitled "Epigraphia Ophthalmologica."

Budapest. Dr. Julius Fejer, who has been for many years assistant to Prof. Szilys in the eye department of the Jewish hospital, has been appointed ordinarius to the Ophthalmic section.

Good eyesight seems to be on the increase in the German army, as according to the statistics furnished by Surgeon-General Seggel, the proportion of recruits having normal vision or better is now 92 per cent., as against 56 per cent. in 1873.

The faculty of the Baltimore Medical University has been reorganized, and amongst its professors we notice the name of Dr. Theodore Cook, Jr., who has been appointed to the Chair of Diseases of the Eye and Ear. Dr. Thomas E. Poole will act as his assistant.

Heidelberg. During the meeting of the Ophthalmologic Congress of Heidelberg, the bust of Otto Becker was unveiled in the presence of a large number of friends and students. The opening speech was made by St. Bernheimer of Vienna, a former assistant of Becker's. There were present many German and foreign professors from all parts of the world.

Würzburg. When Prof. Dr. v. Michel celebrated his 25th anniversary as professor of ophthalmology, a spontaneous reception was tendered to him unofficially by his colleagues, as only 50-year anniversaries are officially recognized by the University of Würzburg. Deputations were received from the 2d army corps, his private students and student corporations, the officers of the University and of the city.

The next meeting of the Western Ophthalmologic and Otolaryngologic Association will be held in New Orleans on February 10 and 11, 1899, giving all attending an opportunity, if desired, of witnessing the Mardi Gras, which is to be held in that city on February 13 and 14. Those intending to attend the meeting should communicate with Dr. W. Scheppegrell, 124 Baronne street, New Orleans, at as early a date as possible, in order that suitable hotel accommodations may be secured.

St. Gallen. July 8, 1898, Dr. Theodor Bänziger, oculist of St. Gallen, died after a long illness, having reached 70 years of age. He was one of the oldest students of A. v. Graefe. In the ophthalmoscope room of the latter's clinic there is pointed out a spot on the wall which Bänziger made by throwing up his ophthalmoscope in the air in an ecstacy of joy on first observing the optic nerve in the living subject. Bänziger brought Graefe's methods to Switzerland and practiced with much success.

The Chicago Policlinic has elected Dr. G. W. Mahoney associate in ophthalmology. Dr. Mahoney has recently returned from the war, where he officiated as one of the surgeons for the 7th Illinois Infantry. He was one of the most popular surgeons that went from this state. We are sorry to hear that he has been quite ill since returning home, and the Record extends to him its congratulations for able services rendered while in the military service, and the hope that he will soon recover from his illness and be able to take up his work again in Chicago.

Drs. Wishard and Mary J. Smith are at present in charge of the American Dispensary in the Persian capital. The hospital is a well built stone building, and is visited by crowds of men and women, who flock into the different rooms. The prejudice of the people often makes it impossible to do work, especially of a surgical nature, properly. For example on one occasion Dr. Wishard removed a tumor from the eye-lid of a young woman who, with the aid of two friends, managed to keep most of her face covered with her heavy veil during the greater part of the operation, exposing only the eye, and not minding the blood, water and pain so long as she could maintain the form of hiding her face.

The St. Louis Ear, Eye, Nose and Throat Hospital, located at 500 North Jefferson avenue, St. Louis, was opened to the public April 1st, 1898. The eye department is in charge of Dr. J. Ellis Jennings, and the ear, nose and throat department in charge of Dr. Leo Caplain. The ground floor is entirely devoted to the outdoor department and is open to the poor from 2 to 4 p. m., daily, except Sunday. Care is taken to exclude from free treatment persons able to pay for professional services. The institution will be incorporated and have the privilege of giving post-graduate courses in diseases of the eye, ear, nose and throat, and of issuing certificates or diplomas to those who have taken the courses.—*Medical Fortnightly.*

It will be of interest to those who have attended the clinics at the Illinois Eye and Ear Infirmary to know that Edgar Remington, who was Superintendent of the Eye and Ear Infirmary for many years, died very recently of heart disease. After attending to some of the business of the institution one day recently, Mr. Remington went to his room. He sat down and was talking to his wife, when he suddenly gasped and called to Mrs. Remington that he was dying. She hastened to his side, and as she clasped her arms about him he became unconscious. Doctor Bartlett, who, with Doctor Noel, had been attending Mr. Remington, was summoned, but life was extinct when he arrived. Mr. Remington's death occurred on the fifty-seventh anniversary of his birth. For twenty-five years he had lived in Chicago.

An important advancement to medical literature will be the forthcoming Sajous' Annual. An Analytical Cyclopædia of Practical Medicine," published by the F. A. Davis Publishing Company, Philadelphia. One volume will appear every six months for three years, and the subject matter will be alphabetically arranged. Each volume will cost $5 in cloth, or $6 in half Russia. The subscribers will have the benefit of a monthly cyclopædia arranged alphabetically, from A to Z, so that a doctor can have a complete synopsis of the latest journal literature to reinfore his system of reference. The volumes will be beautifully illustrated, and will be written by competent medical authorities. The most important part of the contents will be printed in large type. This will be fully supplemented by matter of a somewhat speculative character, involving theories, mooted questions, etc., in small type. This should be an important work, not only to the great mass of the profession, but also to ophthalmologists.

Dr. Albert Campbell Corr, the well-known ophthalmologist of Carlinville, Ill., was recently elected as a member of the State Board of Health, and shortly thereafter was chosen president of the Board. Doctor Corr is 65 years of age, and was born in Macoupin County, of southern parentage. He was educated in Blackburn University, where he was given his degree as Master of Arts. He served in the 133d Illinois Volunteers during the War of the Rebellion, and then studied medicine in the Chicago Medical College. He has been practising in Carlinville since

1875, and is universally respected by his colleagues. He was appointed by Governor Altgeld as a delegate to the World's Congress of Medicine at Washington in 1893. He has been president of the State Medical Society, and is at present president of the Army and Navy Medical Association. The RECORD extends to Dr. Corr its earnest congratulations for his new appointment, believing that under his leadership the Illinois State Board of Health will take another step forward.

WE GIVE THIS FOR WHAT IT IS WORTH. Dr. E. P. Daviss, *South Western Medical Record,* August, says that it is to Charles II. of England that the world owes the discovery of lenses as an aid to vision. After his escape from France, and after his father was beheaded, he became a prisoner of the great Louis XIV., and while living his indolent life in Cologne he met an expert artisan in glass, and, accidentally looking through a small lens belonging to this workman, he found that it greatly benefited his very imperfect vision. He at once bought all his lenses and took the artisan into his own employ. The young prince, born with myopic astigmatism, by mathematical calculation based upon these crude lenses, thus accidentally discovered perfection in the glasses he is said to have worn, and by which his vision was raised from one-half of normal sight up to perfect vision. These glasses are now in the British Museum and were the first spectacles ever made for visual purposes. When Charles was recalled to England and crowned Charles II., he took his French artisan and about twenty others with him, and it is said that as many as 6,000 lenses were made before he got what he wished, and what finally gave him perfect vision. These glasses, when perfected, had cost the prince over £100,000. The good, accidentally it would seem, that followed Charles' exile to France has been worth many times over to mankind the loss of his father's head, the fear of the same fate having been his incentive to flight. The Duke of Monmouth, Charles II.'s favorite son, also near sighted, had but one eye, hence the origin of the "monocle." His father's artisans improved his vision with a single lens over his better eye.

A DE ZENG refractometer, 1898 model, in good condition, can be purchased for $50 from Dr. B. M. Hanna, 812 Penn avenue, Pittsburg, Pa.

THE

OPHTHALMIC RECORD

A MONTHLY REVIEW OF THE PROGRESS OF OPHTHALMOLOGY.

VOLUME VII. CHICAGO, NOVEMBER, 1898. No. 11. NEW SERIES

ORIGINAL ARTICLES.

FRAGMENTS OF STEEL IN THE CRYSTALLINE LENS.

BY S. MITCHELL, M.D.,
OF HORNELLSVILLE, N. Y.
Oculist and Aurist to St. James Mercy Hospital; Oculist to the Erie Railroad.

Illustrated.

The machinist whose everyday duties are such as to demand nearly perfect acuity of vision is, in the exercise of these same duties, constantly exposed to accidents that may not only impair his vision, but deprive him completely of this priceless boon. Flying fragments of steel, from the tools with which he plies his vocation, or from the metal upon which he works, seem to have a special predilection for the eyes. Workers in metals of all kinds as well as the machinist, and in fact all skilled mechanics who wield tools and strike blows in the great industries of this and other countries, are by far the most numerous of all those who come to the oculist with serious injuries to the eyeball.

The outcome of injuries to the various parts of the eyeball, where fragments of steel or iron have been lodged in the globe, has been vastly better since the electro-magnet has come to the assistance of the ophthalmic surgeon. And yet it is the experience of nearly all oculists to have now and then a case where the eye must be enucleated, even though the operation with the magnet may have been successful in accomplishing the removal of the foreign body. Of the conditions that make the removal of the eye imperative, in this class of injuries, it is not necessary to speak of here, since they are common to all.

The pain and inflammation that nearly always attend an injury, whereby even a small piece of steel has been lodged in other parts of the eyeball, are usually quite mild and sometimes absent altogether, when the piece has passed through the cornea and into the lens without injuring the iris.

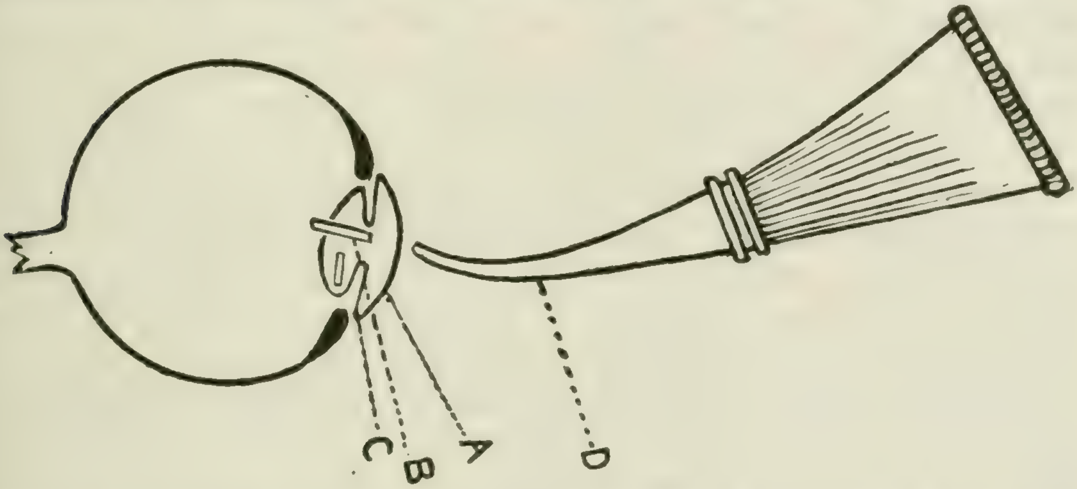
All injuries to the eyes, from flying fragments of metal, would doubtless be more often followed by painful and destructive inflammatory sequela were it not for the fact that the same blow which detached and started the fragment on its merciless errand, often generates sufficient heat to perfectly sterilize the missile. Hence the wound is an aseptic one, just as it would be if made by the discission needle of a skillful and up-to-date surgeon.

The two following cases may be of interest in connection with this subject. The accompanying illustration has been made to serve the double purpose of indicating the position of the fragment of steel in the lens of both cases.

CASE 1. Arthur E., a bright young Englishman, 22 years of age, employed as a machinist in the shops of the Erie Railroad Company at this place, while about his work two hours before and using a hammer and cold chisel, was struck in the right eye by a piece of steel that became detached either from the head of the hammer or chisel. He came to my office soon after the accident. The steel could be seen with the naked eye, apparently a small scale of polished steel resting upon the surface of the lens close to the border of the pupil. The iris was not injured. The position of the steel in the lens is indicated at B in the sketch. The wound was sterilized, and, under cocain anesthesia, the point of the electro-magnet was passed through the wound in the cornea made by the steel fragment. As soon as the magnet began to lift the steel, it was very evident that instead of its being a small scale of metal, it was in the shape of a miniature nail, that had been driven into the lens. The size of this piece is quite correctly shown in the illustration, being 7 mm. long by 2 mm. wide. The contact between the steel and magnet was broken several times during the process of removal. It was accomplished quite speedily, however, and with a minimum amount of traumatism. The reaction and pain following the operation was very slight. A one per cent solution of atropin was used for some time and the eye made a rapid recovery. The lens became opaque very rapidly and was gradually absorbed, so that when the patient was discharged three months later, vision was 20/70 with a +10.50 D lens and J 10 could be read fluently with a +14 D lens. The eye at the present writing, four years after the receipt of the injury, is as plump and white as the other eye; the only disfigurements noticeable are a slight anterior synechia and a turning out of the eye about ten degrees. Vision has declined somewhat in the last year or two, on account of a very thin plastic membrane that blocks the opening in the capsule.

CASE 2. George S., aged 23 years, a machinist in the employ of the Erie Railroad Company at Susquehanna, Pa. Injury received in the same manner as case one. Ten days after the injury he came to me for treatment. He had been under the care of a general practitioner during this time and apparently no mydriatic had been used. He came with no further history than that of having received a blow upon the left eye, while at his work ten days before. The lens was very cloudy as seen through the undilated pupil. There was no trace of any wound upon the cornea that led me to suspect that there might be a foreign body in the eye. Pain and inflammation were very mild and the injured eye was not much more reddened than the fellow eye. A one per cent solution of atropin instilled into the eye readily produced a perfect dilatation of the pupil, when by focal illumination a bright glistening body, that proved to be a fragment of steel, could be seen at the nasal side and well back in the edge of the lens. Its position is shown at C in the sketch.

The eye was anesthetized by the use of a 4 per cent cocain solution, and with a medium-sized cataract knife an opening was made in the cornea at A in the sketch. An opening was also made in the lens capsule, immediately beneath the one in the cornea. As soon as the tip of the magnet passed through the cornea and approached the lens, the splinter of steel was seen to be greatly agitated, and to move about like the needle of a compass, when in the neighborhood of any highly magnetic body. The instant that the point of the magnet entered the opening in the lens capsule, the steel sped to it like a bullet to the mark, and clinging to it was quickly and easily removed from the eye. It was a small fragment from the hammer or chisel, 3 mm. long by 1 mm. wide.



I left the city the day following this operation and during my absence of two weeks, the case was under the care of a very competent general surgeon of this city. A 1 per cent solution of atropin was instilled into the eye three times per day. The eye made an uneventful recovery, the lens being absorbed very rapidly.

Within less than three months after the magnet operation, vision in the eye was 20/40, with +12 D lens, and J 2 could be read very nicely with a +14 D lens.

The magnet used in both of these operations has a very slim and tapering point, slightly curved. This is shown at D in the sketch.

The magnet is charged from the same transformer that I employ in my office for controlling the direct incandescent currents for cautery purposes and for operating an aural masseur. It has a lifting power at the apex of about one ounce.

A FEW REMARKS AS TO THE LAWS OF VISIBLE DIRECTION.

BY CARL WEILAND, M.D.

PHILADELPHIA.

Illustrated.

It was hardly to be expected that the theory of Dr. G. C. Savage as to the laws of direction* would be taken seriously by any student of physiological optics. This same theory had been disproved so thoroughly by Helmholtz, Hering and others, that it could be regarded only with historical interest. It was therefore with some amazement that the writer of these lines saw Dr. Harold Wilson's open letter to Dr. Savage in the August number of the OPHTHALMIC RECORD, but this feeling changed into entire satisfaction, when it was found that the views of those great physiologists, enunciated more than thirty-three years ago, were here upheld so ably. Dr. Wilson certainly hits the nail on the head when he says: "In the study, therefore, of the question of the laws of visible direction, we must not confuse the retinal image with the subjective mental state, sensation or perception, which accompanies it, nor demand a rigid conformity of the two things. Any argument as to these laws based exclusively upon the properties of the dioptric image will necessarily be imperfect. It is not simply a geometrical but a physiological and psychological problem." The writer, however, begs to take exception to one sentence (italicized by himself) in the following passage (loc. cit., p. 382): "A distinction must be made between the apparent and the geometrical position of objects in the visual field. *For all points lying in the visual axis of the eye the geometrical and apparent direction coincide.* This is almost a practical necessity and is exemplified in most bodily movements based upon sight." If it can be demonstrated that even for points *in* the visual axis the common geometrical direction does not always apply, it follows that the italicized sentence is wrong; but at the same time it is evident that thereby the argument of Dr. Wilson, that direction and projection is a psychological act, is made only the stronger. Now, Hering has shown that even for objects lying in the visual line the geometrical and apparent direction do not always coincide. This discrepancy is due to muscular sensations and is most apparent under the influence of convergence, as is evinced by the following experiment which is modified from that given by Helmholtz (Phys. Opt., 2d Ed., p. 751), and is indicated in the following diagram, where O.D. and O.S. respectively indicate the right and left eye.

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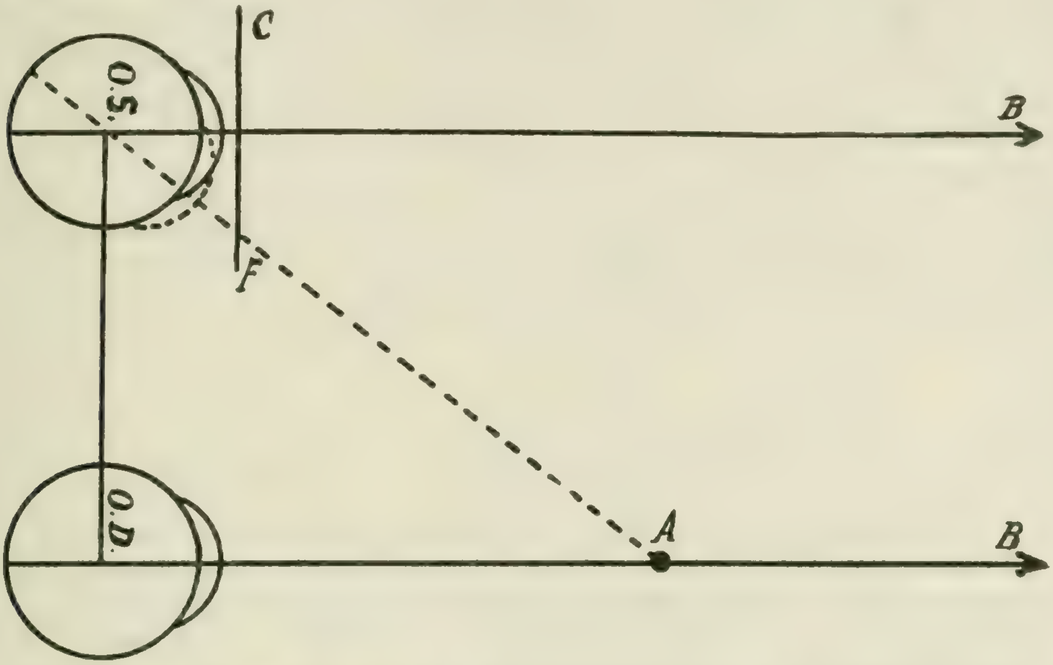
*OPHTHALMIC RECORD, January, 1898.



Look with both eyes in the primary position at a distant object B (like a candle flame twenty feet away) so that both visual axes are directed straight forward aud parallel to each other as indicated by the parallel lines O.S. B and O.D. B. Now bring an object A about six or five inches in front of the right eye in such a manner that it lies with the object B in the same line of alignment (Visirlinie), which line here coincides with the line of direction and visual axis. Then cover the left eye with an opaque screen C F. If now you accommodate your eyes for the object A, you will observe how object B moves plainly to the right, to return again to its former position the moment you relax your accommodation. Now, in this experiment the retinal image of B is not displaced at all, as the right eye does not change its position. It still covers the same retinal area as before, the macula lutea, but is only a little more indistinct. Still you now project the object B to quite a different place in space. The reason apparently must be found in the fact, easily observed,* that the left eye, behind the screen, converges more or less accurately to point A. It plainly rotates to the right and our mind judges from the sensation, accompanying this sudden movement of the left eye to the right, that the object B itself has moved to the right. It is not necessary that the right eye should be accommodated accurately for point A as long as only the left eye converges sufficiently. For those, who like the writer have learned to converge their eyes at will without fixing a near point, the object A is not necessary, as simple convergence of the left eye behind the hand will suffice to bring about the apparent but plain movement of a distant object, while the right eye is kept looking constantly in the same direction.

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*If the screen C F has a narrow vertical slit, or if, in case of the hand, a little light is admitted between the fingers the experimenter will easily observe how this light area in front of the left eye moves to the left during the experiment, thus indicating a movement of the left eye to the right.

Thus it is evident that the direction in which we project a retinal image is not the result of a simple geometrical law but a complex psychological act and that the common geometrical laws of direction do not always apply, *not even in the simple case of objects lying in the visual axis.*

CONGENITAL ABSENCE OF THE IRIS.

Being a Report of two cases of Congenital Iridereмia,[1] occurring in Mother and Daughter. In the case of the mother, both lenses were dislocated, and there was Microcornea and Ptosis. Operation, followed by Glaucoma. Restoration of Vision. With remarks on the cause of Congenital Irideremia.

BY JOSEPH A. ANDREWS, M.D.,
Ophthalmic and Aural Surgeon to the City (Charity), Hospital, New York City.

Illustrated.

Congenital irideremia is of comparatively rare occurrence. In an experience of nearly twenty years, the writer has met with this defect only eight times, the two cases herewith reported being included in this number. All of the cases were observed in hospital practice; two of the number having been seen abroad—one at the clinic of the late Mr. George Critchett, at London, in 1881; the other a few days later, at De Wecker's clinic, at Paris. In only one of these cases was an operation performed (extraction of lens — result unknown to the writer). The case, to be described below, furnished the writer the first opportunity for an operation in irideremia with cataract; and as the result was favorable, under the most adverse circumstances, he feels that others may be interested in the history and a consideration of the conditions which should guide us in forming an opinion as to the probable outcome of an operation for extraction of cataract in this congenital defect.

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[1] Irideremia, or Aneridia: Deficiency of the whole of the Iris.

Fig. I.

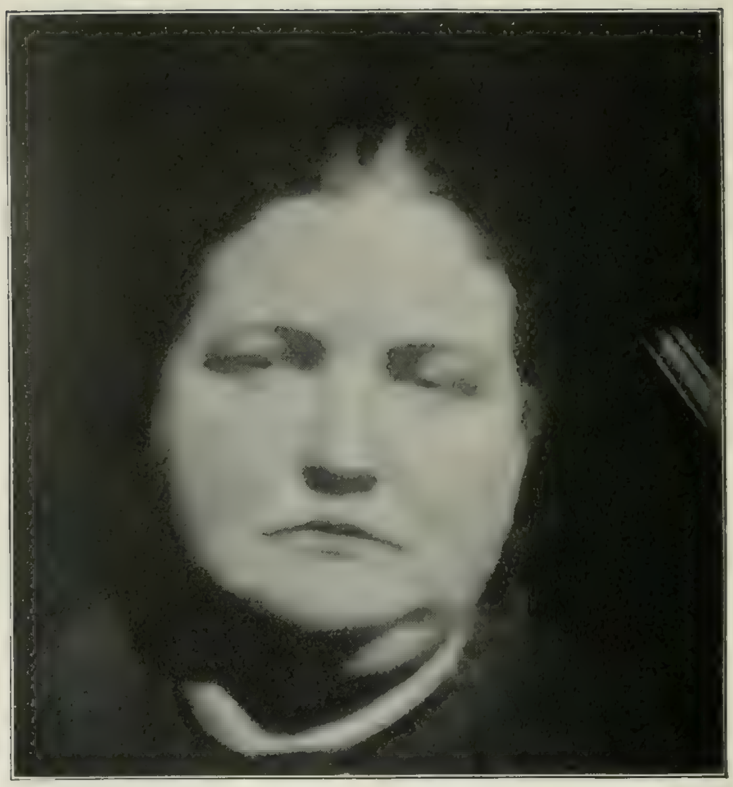
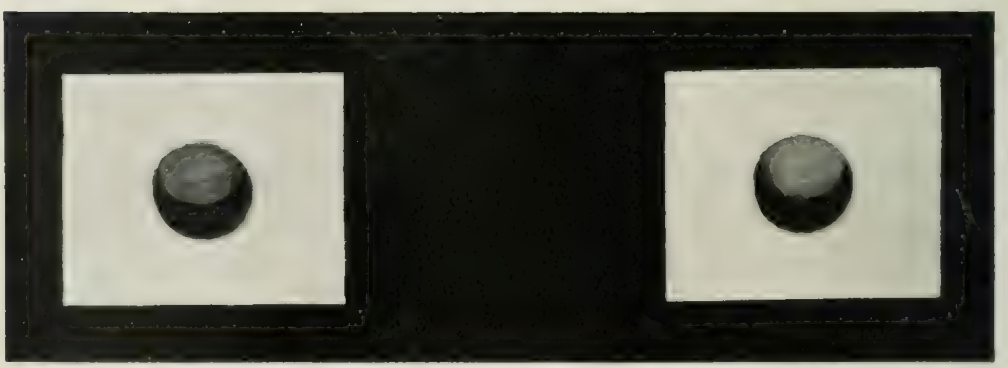


Fig. II.

Congenital Irideremia with both Lenses Displaced Upward.



Right eye.
Cataract mature.

Left eye.
Cataract immature.

Actual size of cornea and lens: vertical diameter, 9 m.m.; horizontal diameter, 10 m.m.; distance between pupillary center, as in above drawing, *i. e.*, 61 m.m.

Case i. Mrs. Mary E. B., æt. 29 years, was referred to me by Dr. G. Walther Otto, of Santa Barbara, Cal., on March 24, 1897, at which place the patient was under my observation. The patient's mother and father, born in Ireland, had good sight. Her brother and sister also had good sight. Her youngest daughter, aet. 2 years, has bilateral congenital irideremia. An infant daughter, who died at the age of four months, the mother stated also had the defect in her eyes. The boys of the family have normal eyes. The evidence of syphilis in man and wife was negative. The patient was large and obese. She presented no other malformation in any other part of the body than the eyes. The eyes were free from irritation; their *tension* was normal; there was no *nystagmus*. *Fig. 1* shows her cast of features and the degree of ptosis; the lids being separated *ad maximum*, unaided by forced action of the frontalis muscle. The corneæ were clear, but below the normal size, i. e., vertical diameter, 10 mm. The eyeballs appeared to be of the usual size; but, according to Priestley Smith's[2] observations, a small cornea indicates a small globe, and such eyes are especially liable to glaucoma. Distance between pupillary centers, 61 mm. The recti and oblique muscles appeared to act normally. There was no trace of iris, by direct or oblique illumination. Both lenses appeared to be of normal size; were displaced directly upward (see *Fig. 2*), and close to the posterior surface of the cornea. The right lens was of a dark amber color. Below the lens, the ophthalmoscope showed the usual red reflex, but the details of the fundus were not well made out. The left lens, by oblique illumination, appeared gray by contrast with the black field below it; by transmitted light, its anterior surface was traversed by parallel opaque lines and patches (not wrinkles), the red reflex from the fundus being clearly seen through the interspaces. Below the lens, the reflex from the fundus was seen as in the opposite eye; but the details of the fundus could not be made out. Vision, when the head was held in the proper position to receive the image, was: R.E.=$\frac{2}{200}$; L.E.=$\frac{3}{200}$; no improvement with glasses for either eye; projection (candle), good in each eye.

Operation. There was no apparent movement of the lens, but the history of these cases shows that fluid vitreous is the rule. Therefore, with a cornea subnormal in size, a lens of full size, and a presumably fluid vitreous, it was not deemed wise to attempt extraction of the cataract. On December 13th, 1897, under cocaine anesthesia and antiseptic precautions, I did a discission of the right cataract, great care being taken to make the least possible traction upon the zonula, and thus avoid the consequences of cyclitis. The eye remained free from irritation until the morning of December 16th, at which time the patient complained that at midnight she had pain in her operated eye, which lasted half an hour. I found the eye hyperæmic; no ciliary injection; no photophobia; no pain to touch: tension, normal. December 17th, considerable pain in the operated eye during the night. T+2; lens diminished in size. Ordered solution of eserine sulph. (gr. ss. —oz i). December 18th, had a great deal of pain in the eye during the night, T+2. Patient thought the eserine solution increased the pain (?). I instilled a 2 per cent solution of cocaine hydrochlorate, which gave relief; following this up with a 2 per cent solution of pilocarpine muriate. December 20th, T+2; I did an anterior sclerotomy, and continued instillation of pilocarpine solution. December 29th, tension is normal; the lens, diminished in size, has dropped to the lower part of the anterior chamber; or rather, lower border of the cornea. The eye being free from irritation, and fearing to lose the lens in the vitreous chamber, I extracted it through a section laid in the cornea. There was loss of vitreous, but the eye made a good recovery. Patient remained under my observation until April 2nd, 1898, at which time she left Santa Barbara to take up her home in Oregon.

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[2] E. Treacher Collins. *Transactions Ophthal. Soc. U. K.*, Vol. X, 1890.

On January 31, 1898, R. V. w. $+12 = D\frac{15}{100}$
L. V. w. $+12D = \frac{15}{100}$ (no operation).

The fundus of the right eye is now clearly made out. The optic disc shows no cupping, nor is there any arrest of development or inflammation in the nerve, retina or choroid. April 2, 1898, the day of patient's departure, R. V. $\frac{15}{50}$ w$+12$D.

CASE 2. Rosie B., æt 2 years. The eyes were free from irritation; there was no nystagmus; no increased eyeball tension; no ptosis; external muscles acted normally. The eyeballs appeared to be of the usual size. The cornea showed normal dimensions, and they were everywhere free from opacities. Neither eye showed any trace of iris. Both lenses were clear, and in the normal position. There was no changes in either fundus, i.e., the optic nerve, retina, and choroid were normal.

REMARKS. It appears that the first undoubted case of congenital irideremia of which we have any record, was observed by Morrison (London, 1820); but he described it as "*congenital mydriasis.*" Even Sichel[3], as late as 1859, described this condition as "*dilatation congéniale extrême de la pupille.*"

Ammon[4] (1829), was the first to publish an anatomical account of congenital irideremia. His first observations were made upon the eyes of a child still born and partly decomposed. Later, he examined the eyes of two calves and a sheep which were subjects of irideremia. Of late years, numerous cases of this defect have been recorded in ophthalmic literature, and numerous hypotheses have been suggested to account for its occurrence. Ammon's view was that the absence of the iris was simply the result of an arrest of development of the uveal tract. This was a most rational explanation, and Arnold thought that he had found an anatomical basis for this arrest of development, by attributing the absence of the iris to failure in the formation of the anterior ciliary arteries; but in the microscopical examination of an eye with congenital irideremia made by E. Treacher Collins[5], these arteries were found well developed. Manz[6] has suggested the explanation that iris is arrested in its development by the resistance of the lens, which, as we know, lies in contact with the cornea during the development of the iris. While Manz does not furnish a reason for the lens remaining so late in contact with the posterior surface of the cornea, it seems that the presence of an intrauterine inflammation, should further explain Manz's view. This opinion is supported by the anatomical picture furnished by those eyes with irideremia which have come to a microscopic examination. In the detailed report of a careful microscopic examination of an eye with irideremia, published by Rindfleisch[7], that writer advances the inflammatory theory. He expresses the opinion that an intrauterine inflammation, leading to perforation of the globe at the sclero-corneal margin (see Fig. 3), with escape of aqueous, had kept the lens in contact with the cornea. So far as I have been able to learn from the reports of the microscopical examination made in other cases of irideremia, there is no proof of the presence of the perforation referred to by Rindfleisch. Furthermore, we know that under normal conditions, the lens and cornea are in close apposition at the time the iris is developing, the tunica vasculosa lentis alone intervening between these structures during that period.

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[3]. Sichel. *Du Mydriasis Congenital Gazette*, hebdomad, ii, p. 308.

[4]. F. A. Ammon. *Ammon's Zeitschrift f. Ophthal.*, Bd. ii, 1829; also, by the same author: Irideremia und Hemiphakia congenital: *Verhandl. der Kais. Leopold-Carolinisch. Deutsch. Acad. der Naturforscher*, Bd. xxvii, 1858.

[5]. *Trans. of Ophtnal. Soc. U.K.*, vol. xiii, 1893.

[6]. Manz, Die Missbildungen des Menschlichen Auges, *Graefe u. Saemisch's Handbuch der Ges. Augenheilk, Bd. ii.*

There certainly is proof to support the inflammatory theory. At any rate, it is important for us to know the pathological changes which we should look for in a given case of irideremia; for their presence or absence must greatly influence the prognosis as to the restoration of sight.

Anatomical Examination.—Ammon[8] found the lens system free from defects in development. The cornea showed changes in Descemet's and Bowman's membrane. Pagenstecher[9] found the stump of iris represented by a small pointed pigmented and vascular prolongation, projecting from the ciliary body, as a fork-like division of Descemet's membrane and firmly adherent to the cornea.

Rindfleisch's[10] case showed rudimentary iris in the form of a narrow ring; central part of cornea clouded by outgrowths of grayish-white translucent points; cornea showed a broad arcus senilis; Descemet's membrane was well developed and intact; likewise its endothelium, which latter was everywhere pigmented; the peripheric cloudiness of the cornea was due to dense infiltration with round cells between upper layers of parenchyma, and between these and the epithelium; the sclera was of about normal thickness in the posterior half of the globe.

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[7] G. Rindfleisch, *Graefe's Arch.* Bd. xxxvii, Abt. iii, 1891.

[8] F. A. Ammon. *Verhandl der Kais. Leopold. Carolinisch. Deutsch Acad. der Naturforscher*, Bd. xxvii, 1858.

[9] *Heidelberg. Ophthal. Soc.*, 1871.

[10] Loco cit.

In Treacher Collins'[11] case, there was adhesion of the rudimentary iris and of a permanent pupillary membrane to the back of the cornea. The angle of the anterior chamber was developed only in the upper half of the globe; this defect being accounted for by the position of the lens. In Rindfleisch's case, the space between the iris and the cornea was filled with free pigment granules and a few round cells. (See Fig. 3). Rindfleisch found the ciliary muscle flat; and the ciliary body not fully developed; both lenses were dislocated upward; the right lens showed cataracta corticalis, posterior as well as anterior; the left lens was totally clouded and apparently wrinkled and calcific. It appeared that intra vitam, the zonula had been attached to the lens all around; but its fibers seemed to have been too long and yielding to retain the lens in its normal position. The zonula fibers were more numerous and stronger above than below, which would explain the displacement upward of the lens. The *vitreous* was detached, and fluid, with its hyaloid separated from the retina, from the equator forward; for the rest of the posterior half it was firmly adherent to the retina. The *choroid* was detached in two places for a considerable extent. The *optic* nerve showed central physiological excavation.

The histological observations are not alike in all of the cases of congenital irideremia, which have so far come under inspection with the microscope, but they show the results of inflammation. This fact, together with a careful study of the clinical picture of the condition as it unfolds itself in the early years of life, force upon one the belief that inflammation plays an important part in the causation of the defect under consideration. Of course this view, even if proven the right one, would not help us to correct the deformity, but it does, so far as it goes, teach a practical lesson, which may aid us, in some instances, to forestall the natural tendency of certain complications in irideremia, and, by a timely operation, prevent blindness.

SYMPTOMS. Congenital irideremia shows a strong tendency to hereditary transmission. In three generations twelve members of one family were found by De Beck[12] to have either colobomairidis or irideremia. It is nearly always bilateral. Manz[13] states that it has been observed in one instance on one side only. While, in most instances, focal illumination may not reveal any trace of iris, the microscope has shown that there is always a rudimentary iris present. The cornea is generally full sized, but may, as in the writer's case, be smaller than normal. The cornea may

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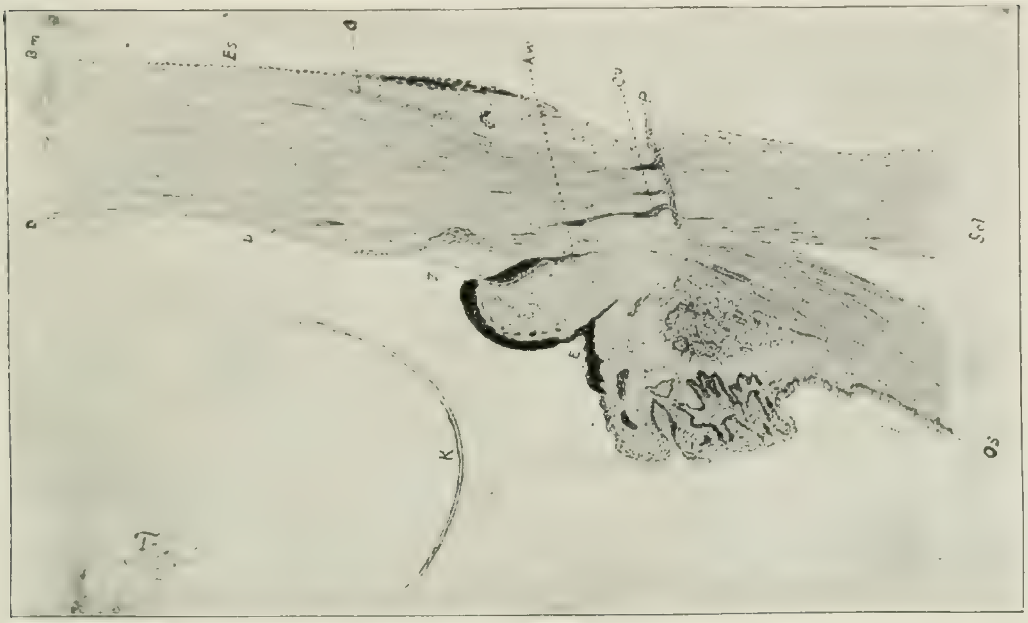
[11] E. Treacher Collins, *Trans. Ophthal. Soc. U. K.*, Vol. XIII, 1893.

[12] De Beck, *Trans. American Ophth. Soc.*, 1894.

[13] Manz, *Graefe u. Saemisch Handbuch der Augenheilkunde*, Bd. ii.

Fig. III.

Section from Region of Perforation of Cornea in a Case of Congenital Irideremia.



Es, epithelial layer of cornea; G, bloodvessel; Cv, ciliary vein in communication with circ. venosus; P, site of perforation of sclera; Kw, angle of anterior chamber; Z, coagulum between iris and cornea; E, drawing in of iris; K, detached capsule of lens. (After Rindfleisch.)

be clear, but in most instances, if not at birth, at least in the early years of life, it shows some pathological change. There may be anterior or posterior polar or lamellar cataract; and the lens is frequently displaced, the displacement being bilateral and generally upward, the position in which congenital displacement is most commonly found. The lens may remain clear for some time, but some form of cataract will generally develop before puberty. Hirschberg[14] observed a case of congenital irideremia from the fourth month to the tenth year, in which it was proven that the posterior polar cataract, ectopia lentis and nystagmus, myopia and glaucoma developed later. *Nystagmus* is present in some cases; but this symptom may be absent where, as in the cases recorded by Harlan, Goldzier, and others, the conditions were most favorable to its development. An ophthalmoscope examination may be made difficult or impossible by the presence of nystagmus or opacities in the cornea, lens, or vitreous. When the conditions are favorable, we may find the fundus normal. Changes in the *choroid* have frequently been observed, i. e., coloboma "atrophic spots" (Benedetti). Detachment of the retina has been noted in some instances. Harlan[15] found the optic nerve atrophied and greatly distorted. Pathological excavation of the nerve has been observed by Klein (1877), Brunhuber (1877), Samelsohn (1877), Lembeck (1890), Goldzieher (1897). In sixty-five cases of congenital irideremia collected by Tokuss,[16] only four cases showed pathological excavation of the optic nerve. It may seem paradoxical to state that *glaucoma* occurs in congenital absence of the iris, since we cut out a piece of iris to cure glaucoma; but oculists now agree that the effect of the operation for glaucoma is not so much due to the excision of the piece of iris as to the opening up of the filtration angle by cutting the iris at its extreme periphery. As has already been stated, those cases of congenital irideremia which have come to microscopical examination show that although clinically the absence of the iris seemed to be complete, the microscope always reveals a rudimentary iris root. There is, therefore, in this defect always an anatomical foundation for glaucoma; for the rudimentary iris, when pushed forward, as by the displaced lens, may block the filtration area. The case of Treacher Collins[17] furnishes another remote cause for glaucoma in irideremia; the glaucoma, in that instance having been induced by a failure of the separation of the tunica vasculosa lentis from the back of the cornea.

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[14] Hirschberg, *Centralblatt f. prak. Augenheilk*, 1888, p. 13.

[15] George C. Harlan, *Transactions of the College of Physicians, Philadelphia*, Third Series, Vol. VI, 1882.

[16] Tokuss, Inaugural Diss., 1888.

[17] Loco cit.

Treatment. Opaque lenses should be removed as soon as possible. When the lens is displaced, according to the indications of the case., *i.e.*, size of cornea and age of the patient, either a discission or extraction should be done. It should be borne in mind that the change in the position of the lens has its anatomical cause in changes of the zonula of Zinn. If there be no tremor of the lens, it might be assumed that the vitreous is not fluid; but this is by no means necessarily the case. When the lens is displaced the difficulties in performing discission (as in microcornea) is increased, and great care should be taken to fix the lens, and thus avoid as much as possible making undue traction upon the zonula, and thus escape cyclitis. A low degree of increased tension following the discission or extraction may yield to myotics. If the tension should not yield to eserine or pilocarpine, then anterior sclerotomy must be done.

Santa Barbara, Cal.

THE ACTION OF COCAIN UPON THE MUSCLE OF MÜLLER.

BY C. D. CONKEY, M.D.
WEST SUPERIOR, WIS.

One of the effects of cocain when instilled into the eye is to dilate the palpebral fissure. This effect so seldom spoken of by writers is, so far as I know, constant, and in some cases very striking. This action is ascribed by writers to the physiological action of cocain upon the unstriated muscular tissue of the Musculus Palbebralis Superior of Müller. This muscle is dependent for its nerve supply upon the sympathetic system. Cocain causes a spasm of the muscular tissue in the same manner that it produces a spasm of the capillaries and fine arterioles in the eye and in other tissues of the body when it comes in contact with them, and it is the spasm of the muscle which produces the increased widening of the palpebral fissure.

This peculiar action of cocain was presented to my notice a few days since in a very striking manner:

A young woman and her husband from a distant town consulted me for a ptosical condition of the woman's left upper eye lid. The trouble was very noticeable, having the thick heavy appearance of a lid greatly thickened by inflammatory disease. The trouble was of long standing, dating from childhood, and attributed to an inflammatory lid trouble. The deformity produced did not interfere with vision. The case had received treatment from a number of medical men without results. The under surface of the lid was comparatively smooth with the exception of two or three little nodular bodies scattered over its surface, otherwise it was free from disease. The refraction of the eyes were O. D. $\frac{20}{20}$ w—0.55d. 180° O. S. $\frac{20}{20}$ w—0.27d. 180°. After instilling a few drops of a 4 per cent solution of cocain muriatis upon the under surface of the left lid, I clipped off the little nodular masses upon its surface. A few moments later the husband of the patient called my attention to the fact that the drooping of the lid had disappeared. Not only did this prove to be the case, but the eye was actually wider open than the right. The effect was looked upon as little less than a miracle by the patient and her husband, but I disillusioned their minds by telling them that the lid would lapse back into the former position upon the disappearance of the effects of the drug.

The lid in all its movements was as free and active as the right, as there was no other lesion in the eye due to paralysis of the third nerve, and as the lid while drooping was not fixed in its abnormal position, I should say the case was one of those spurious cases of ptosis we find remaining after trachoma, when other evidences of the disease have disappeared. The action of the stimulated muscle would probably have produced a much less decided result, had there been true paralysis of the levator palpebrae superioris. This muscle had undoubtedly lost much of its power, but still when aided by the muscle of Müller, readily lifted its load.

The action of cocain, as illustrated in this case, might be put to some service as an aid to diagnosis between those cases of true ptosis due to paralysis of the third nerve, those that are spurious due to inflammatory thickening, and those that are due to paralysis of the sympathetic nerve supply to the muscle of Müller. As a rule these various conditions are accompanied with well marked signs which enable one to quickly make a differential diagnosis.

Paralysis of the motor nerve supply of the levator palpebrae superioris is generally accompanied by a dilated pupil and palsies of one or more of the rotary muscles of the eye ball. Paralysis of the muscle of Müller is, as a rule, accompanied by a contracted pupil and a general disturbance of the temperature and circulation of the face upon the affected side, while spurious ptosis is accompanied by none of these signs. However, there do occur cases where the signs are not well marked and where doubt must exist. In this class of cases cocain might throw much light upon the diagnosis.

AN AUXILIARY SKIASCOPE.

BY E. C. ELLETT, M.D.

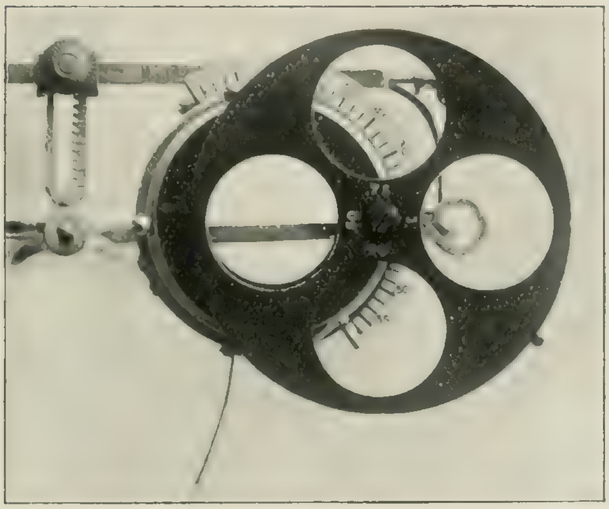
Ophthalmic and Aural Surgeon to St. Joseph's Hospital, the Children's Home, the Shelby County
Poor and Insane Asylum, Editor of the *Memphis Lancet;* formerly House
Surgeon in Wills' Eye Hospital, Philadelphia.

MEMPHIS, TENN.

Illustrated.

Since the art of Skiascopy has secured so firm a place among the methods of estimating refraction, many devices have been put forward to facilitate its application. Many of these are quite elaborate and correspondingly expensive, such as the instrument of Jennings, that of Perkins, and others. Simpler models are those of Würdemann and Marple, which are practically the same, while Jackson, to whom we are most indebted for the elucidation and popularization of the test, discards all apparatus in favor of the trial frame and test lenses. I have devised what I choose to term an *Auxiliary Skiascope*, to be used in connection with the trial frame and test lenses, which is quite simple, not expensive, and in my hands has proven of considerable utility. Besides this instrument I have used the Würdemann hand skiascope and the revolving skiascope of Hardy, and the device herewith presented is intended to overcome what I have found to be the disadvantages attending the use of these instruments.

The Würdemann skiascope consists of two rows of lenses, plus and minus respectively, set in a long frame with a handle at the end. The patient holds this before the eye, and raises or lowers it as directed to bring successively different strengths of lenses in front of the eye. Unless the other eye is occluded the patient will not bring the lens directly in front of the pupil, and is apt to tilt the frame, giving an astigmatic effect to the lenses. These disadvantages are in a measure overcome by putting on the patient's face a flat, one-celled trial frame, carrying a solid disc before the eye not under test. The skiascope is pressed flat against the cell before the other eye, thus preventing it from tilting, and the fact that the other eye is occluded makes it easier for the patient to get the lenses in front of the pupil. In the same way the Hardy disc, which is a large hard rubber disc carrying two rows of lenses, plus and minus respectively, and supported in the patient's hand by a



handle, may be used. The disc is turned at the surgeon's direction to bring the lenses successively before the eye under test.

The instrument which I present consists of a hard rubber disc 55 m.m. in diameter, carrying four lenses of plus quarter, plus half, plus three-quarters and plus one dioptre, 20 m.m. in diameter. This disc is supported at its center by a pin on which it revolves, and the pin is fixed at its other end to the periphery of a second disc, which is a Thorington axonometer without the line to indicate the axis; that is, it is a hard rubber disc with a 20 m.m. opening in the center, mounted as a trial lens is. This fits the trial frame as an ordinary trial lens does, and is secured by two flat arms projecting backwards from the handle, and intended to embrace the projecting post of the trial frame which supports the temple wire. The strength of the lenses is indicated by figures on the front of the larger disc. The edge of this disc is notched opposite each lens, and a projecting pin catching in these notches stops the lenses exactly in front of the pupil. This little instrument is light, fits the frame firmly, and the relation of the lenses to the patient's eye is not disarranged by any movements of the patient's head.

The instrument is intended for use in practicing skiascopy at one meter, and its use may be illustrated by the following example: Suppose a patient, with the eyes under the influence of a proper cycloplegic, is found to have a hyperopia of 1 D. by the subjective test with lenses and card. He is taken to the dark room, seated at one meter from the surgeon, and a trial frame placed on the face with the correcting lens in the cell nearest the eye, the auxiliary skiascope in the front cell and the other eye occluded. The movement of the shadow (with the plane mirror, and the weakest lens of the skiascope before the pupil) is with the mirror. The patient revolves the disc at the direction of the surgeon, bringing successively the half, three-quarter and 1 D. lenses in front of the eye. The last should reverse the shadow in all directions, otherwise the correction is inadequate. Astigmatism will of course be indicated by a failure to reverse (or early reversal) in one meridian.

Suppose the eye possesses a simple myopia, or 1 D. The similar use of the disc will change the movement of the shadow exactly as in the first instance, and the degree of myopia is the algebraic sum of the two lenses $(+1-1=0)$ with -1 D. added. In astigmatism the meridians of least and greatest curvature must be separately corrected.

While the use of this instrument limits the skiascopic test to that of confirmation, leaving the refraction in the illiterate, very young and ignorant to be measured by some of the other methods, its use in this way has been of such material benefit to me that I am constrained to present it.

I may say that I have tried a double disc to give a larger series of lenses, but it makes the instrument too heavy, and causes the trial frame to sag at one side, besides being quite complicated. I have also tried other methods of attaching the apparatus to the trial frame, but none answer so well as this. While the attachment described will not fit all trial frames, a very slight modification will enable it to do so.

The instrument is made by F. A. Hardy & Co. of Chicago, to whom I am indebted for their assistance in working out the details of the instrument, and for their interest and care in its manufacture.

Continental Building.

RING SCOTOMA WITH NIGHT-BLINDNESS.

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Illustrated.

Ring scotomas are rather infrequent and interesting, and the combination of ring scotoma with night-blindness renders the following case, I trust, not unworthy of being reported:

Mrs. ——, age 37 years, first consulted me concerning her eyes in January, 1897, with the history that she had had poor sight all her life, though she had noticed it more in the past few years. She has difficulty in recognizing people on the street and in seeing in the evening, or even in a dimly lighted room. At first she thought that she had had this hemeralopia for only a few years but later after talking to her friends about it and thinking more about it herself, she was of the opinion that she had had it for fifteen or twenty years or even longer; in short, it is extremely probable that it was congenital. Glasses were given her some years ago and special reading glasses several years later, but they do not seem to afford much help. She says the eyes are very slow in focusing either in looking from a distant object to something close at hand, or the reverse. Her field of vision seems small so that in reading she cannot see a whole line at a time and consequently she must read very slowly. She finds difficulty in playing cards in that she frequently mistakes the number of spots on the card, not seeing all of them at a time. This difficulty in seeing a whole line or several objects at once has been especially noticeable she thinks, for one and a half or two years and she inclines to the opinion that it is getting worse, or else it simply seems worse because she notices it more. She never suffers any pain in the eyes, nor with headaches, except a dull ache when she is very tired; but this evidently is not of eye origin. Muscæ volitantes, some large and variegated in color, annoy her at times, especially when she is tired. The eyes are never red, but when a child she did at times have slightly inflamed lids.

The family history is good and is negative as regards any eye trouble. Her mother is living and healthy, aged sixty years. Her father died under forty years of age from some disease of the liver after an invalidism of considerable length of time. Her own health has been good though she is subject to occasional attacks of tonsillitis. She has had influenza or "la grippe" several times and the eyelids were inflamed during those attacks. She has never had rheumatism, though she does at times have muscular cramps when the muscles are put to some unusual exertion. She presents no symptoms pointing to gout and there is no history of it in the family. She has never had malaria. She has two healthy children and syphilis can, I believe, be excluded, nor is there anything pointing to inherited specific disease. The teeth are rather bad, one incisor in the upper jaw being somewhat notched and the two middle ones capped with gold. The hearing is normal. She inclines to think that the eyes may be worse since the birth of her children, but she had no trouble with the eyes while pregnant nor immediately afterwards, and it seems altogether likely that there is no relation whatever between the eye trouble and the birth of her children. Menstruation has always been regular and the eyes have never been more troublesome at such times. She has a lateral laceration of the cervix and also a lacerated perineum, but this condition is better than it was several years ago and the gynecologist is of the opinion that it has no effect upon her general health. She feels well except that she tires very readily; is stout, but very "flabby." She has recently been getting massage and as a result is feeling better. Her color is good, though formerly she was rather pale. She takes very little exercise, bowels are regular, appetite is poor. She thinks her circulation is poor, as she suffers a great deal with cold hands and feet. Her physician, however, thinks this is due chiefly to the fact that she does not dress warmly enough. The heart and arterial system are normal. The knee jerks are apparently diminished somewhat, station is good. Examination of the urine shows it acid in reaction, specific gravity 1011, neither albumin nor sugar present, while the microscope reveals a few crystals of oxylate of lime and urates, some epithelial cells but no casts.

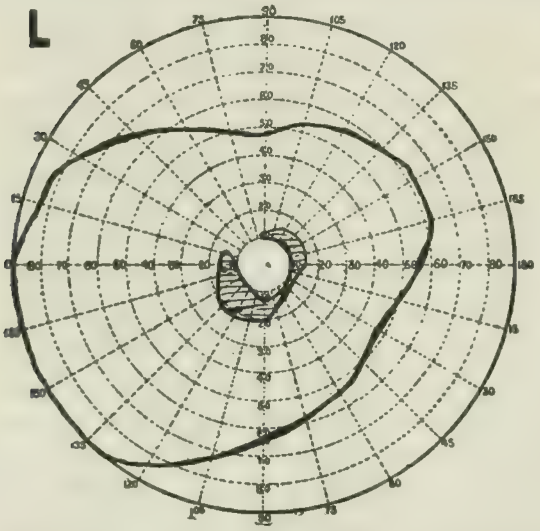
Examination of the eyes. Vision O. D. 6-22 partly O. S. 6-15.

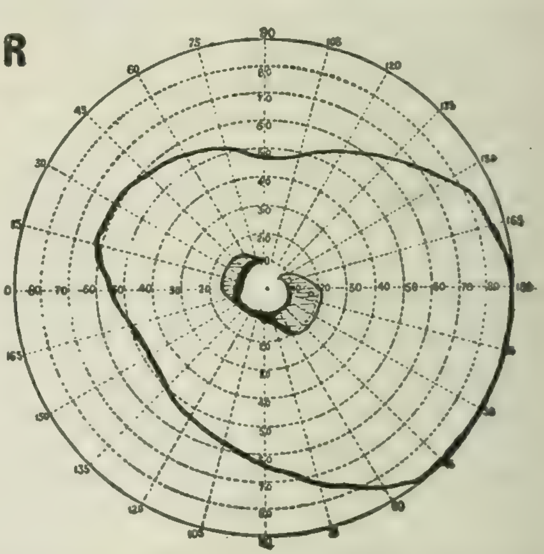
Accommodation: O. D. Jaeger No. 1 pp. 10 Cm with difficulty
O. S. " " " " 11 "

Muscles: At a distance Exophoria 1 degree, left hyperphoria 1½ degrees; in accommodation exophoria 2 degrees. The eyes move freely in all directions.

The pupils are equal and respond promptly to light and in accommodation. The tension is normal. There is slight scaliness at the roots of lashes on both upper lids. She complains at times of slight epiphoria but the puncta are patulous and in normal position and there is no indication of any obstruction in the duct. Javal's Ophthalmometer: O. D. 1½ D, axis 75 against the rule. O. S. ½ D, axis 75° against the rule. Perimetric examination reveals the interesting feature of the case—a partial ring scotoma symmetrically placed in the two eyes. The outer limits of the form field are normal and so also are the color fields. The scomotas are well shown in the accompanying charts taken in January, 1897, shortly after her first visit. They have remained practically unchanged to the present time, and whatever slight variation has been found was probably due to a difference in degree of the intensity of the light under which the examination was made, as the interesting point was brought out by Dr. Herman Knapp who saw the case a few months ago that by moderate obscuration of the room a total ring scotoma was found in each eye.

Ophthalmoscopic examination: O. D., media are clear, disc is round, of good color, with physiological cup; slight choroidal disturbance was present about the edges of the disc, with a narrow line of pigment deposit. The vessels are normal in size but show somewhat unusual distribution. Their origin is pushed toward the temporal side and they round toward the macula by a double curve. There is general disturbance or irregularity of the superficial pigmentation, more marked below and on the nasal side. This evidently has no bearing whatever upon the scotoma, which is also most marked below. In the far periphery there is some uncovering of the choroidal circulation with the spaces between the choroidal vessels darker than usual. With the exception of one very small round spot in the periphery there are no pigment spots in the fundus. O. S., the condition is practically the same except that the disturbance or irregularity of the superficial pigmentation is more marked. The nerve is normal in appearance and there are no pigment spots.





She would not consent to the use of a mydriatic, much as I urged its necessity, and I was obliged to measure her refraction without it, with the following result:

O. D.—2.25c axis 75° V=6-7 .5 partly
O. S.—0.75s ⌢⌣—1.25c axis 75° V=6-6 partly

It required some time for her to become accustomed to these glasses, but since then they have helped her very much at distance and even more for close work.

We have, then, two interesting symptoms: the hemeralopia and a ring scotoma. In the presence of the former we naturally would think first of the possibility of retinitis pigmentosa, but nothing in the fundus gives any indication of it, although the ophthalmoscopic examination was not made with the iris paralyzed, "a prerequisite," according to Gould, "of accurate examination of the extreme periphery of the field." Nor could it be a case like those described by Gould (*Annals of Ophthalmology*, 1897, p. 695,) of retinitis pigmentosa without the characteristic pigmentation, for in these, as in the typical cases of pigmentary degeneration, there was contraction of the form field, while in our patient the outer limits of the form and also of the color field were normal. The ring scotoma would not of itself exclude retinitis pigmentosa, for Wilbrand (Norris and Oliver, *System of Diseases of the Eye*, volume II, p. 202,) in his article on perimetry says that in this disease ring scotomas are sometimes found. "In such cases the color field is contracted, existing only in those portions which are connected with the fixation point." Schöbl (*System of Diseases of the Eye*, volume III, p. 466,) in his article upon diseases of the retina speaks of ring-shaped defects occurring in rare instances in retinitis pigmentosa. A number of cases have been reported, as by Wagenmann at the meeting of the *Ophthalmological Society* at Heidelberg, August, 1897, three cases by Noyes (*Diseases of the Eye*, Second Edition, page 627), and others. This hemeralopia is also sometimes found associated with chorio-retinitis, choroiditis disseminata and other conditions, all excluded here, and in some cases is congenital without concentric field limitations and without any pigmentary changes.

Beside retinitis pigmentosa, ring scotoma is due sometimes to chorio-retinitis, or choroiditis, especially the syphilitic type, and a number of such cases are reported, as by Wilbrand (*System of Diseases of the Eye*, Norris and Oliver, Volume II, page 203,) and by Karl Baas at the meeting of the *Ophthalmological Society* at Heidelberg, August, 1897, (reported in *The Archives of Ophthalmology*, Volume XXVII, page 353). It is due also to lesion of the nerve. Vossius (*Archives of Ophthalmology*, Volume XXVII, page 353,) reports a case due to an acute attack of optic neuritis occurring in a young lady suffering with arthritis. De Schweinitz (*International Clinic*, Volume III, Fourth Series, page 315,) reports a case which he explains "by an interstitial neuritis affecting the intermediate fibres of the nerve without seriously encroaching upon the peripheral and macular bundles." He also reports another case of irregular ring scotoma which is more difficult of explanation, and which it was my pleasure while I was his assistant to examine. Burnett (*Transactions American Ophthalmological Society*, 1887,) in an interesting article upon this subject, reports two cases. He does not believe it due to disease inside the eye-ball, but to disease of the nerve. He lays special emphasis upon the division of the nerve into three zones: the central, intermediate and peripheral, and says, "in ring scotoma we probably have the intermediate fibres affected by a circumscribed neuritis of the same nature as that which affects the macular fibres in the cases of central scotoma leaving the peripheral and macular bundles intact, or it is possible that there may be pressure on these fibers where they lie on or near the surface by an exudation or growth from some contiguous tissue." Von Graefe was the discoverer of ring scotoma, and he thought it due to a lesion in the nerve, and Landolt (*Annales d' Oculistique*, 1880,) was of the same opinion regarding the case he reported of double annular defect associated with lead poisoning. The condition in my patient has remained unchanged since she had been under observation, and I am rather inclined to the opinion that the ring scotoma, like the hemeralopia, is probably congenital and will not be progressive. Dr. Knapp, if I may be permitted to quote from a recent personal letter, inclines to the same opinion, believing the defect shows a "rudimentary development which future investigation will doubtless clear up." Only careful observation of this case for a considerable period of time will definitely settle the fact whether our opinion concerning the non-progressive character of the defect is correct or not, and we shall watch it with much interest.

514 New England building.

OPHTHALMIC MEMORANDA.*

BY G. E. DE SCHWEINITZ, A.M., M.D.
PHILADELPHIA.

Illustrated.

CASE I. PARALYSIS OF THE LOWER HALF OF THE IRIS (PARTIAL IRIDO-PLEGIA) AS A SEQUEL OF IRITIS.—Even after perfectly cured cases of iritis slight traces of the original disease can usually be detected: pigment on the lens capsule, small points of former synechiae spots of discoloration, atrophic fibres, etc.; but in my experience it is uncommon to observe as the sole sequel of severe irido-cyclitis complete loss of the action of one-half of the iris, all other functions of the eye having been restored to the normal state.

Mary A., unmarried, aged 20, born in the United States, consulted me on the 10th of January, 1898, for relief from an attack of inflammation of the left eye.

History.—The patient was a slender girl, of good coloring, who maintained that she had always been in perfect health, her only complaint of general disability being an occasional attack of lumbago. The family history was good, and there was no reason to suspect specific taint. Six days prior to her visit the left eye began to be painful and watery, and neuralgic pains began to shoot through the brow on the same side. The next day the pain was much worse, and the eye became intensely, congested and tender. The weather at the time was very cold, and the patient, during a menstrual epoch, had gone skating, and afterwards had ridden for a long distance in an unheated car.

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* Read in part before the Section of Ophthalmology of the College of Physicians of Philadelphia, October 18, 1898.

Examination.—V.=5/30 with difficulty. There were fine pericorneal injection, general bulbar flushing, corneal haze punctated below, discoloration of the iris, and deep anterior chamber, but no synechiæ. The pupil dilated evenly under the influence of a mydriatic. Only a very hazy view of the fundus was obtained.

Atropine, hot compresses and salicylate of sodium were ordered. No improvement occurred in three days; in fact, the ciliary tenderness and flushing increased, and the fine punctate haze in the cornea settled into a more or less characteristic triangular patch of dots upon Descemet's membrane. Tension was slightly raised, and vision sank to the ability to count fingers at one foot.

The temple was now leeched, and for the salicylate of sodium were substituted iodide of potassium and bichloride of mercury. For several days the haze in the cornea and the discoloration of the vitreous were so great that only a faint reflex from the fundus was obtainable. Then there was gradual clearing of the inflammatory and exudative processes and breaking loose of one small synechia which had formed below. The pupil remained perfectly round while under the influence of the mydriatic.

At the expiration of a month the eye-ground could be seen, the disc being congested and hazy, and with +1 D.^{c} axis 180, V.=6/12. At the end of another month this astigmatism disappeared and with + 75 D.V.=V6/5. The iris regained its color, and the media were entirely clear with the exception of a few points of fine haze in the lower portion of Descemet's membrane, which could be determined only with a corneal loup.

On April 19, 1898, or three months after the attack of iritis, vision without correction being 6/5 the amplitude of accommodation 10 D., and the media clear, the pupil under the influence of direct daylight assumed a horizontally oval shape, while the opposite pupil was perfectly round. The movements of the iris were present only in its upper half, the *lower half being completely paralyzed.* Strychnia was ordered, and the patient was not again seen for two months, when precisely the same conditions obtained, i. e., only the upper part of the iris was mobile. This partial iridoplegia has continued to the present time, giving no inconvenience, and not being readily detectable unless the eyes are submitted to the ordinary examinations for eliciting the pupillary reflexes.

A similar condition after a blow on the eye, that is partial traumatic mydriasis, is a comparatively common occurrence, and may be due to injury of the delicate nerve endings in the sphincter of the iris, associated sometimes with a tear in this membrane. In the present case the loupe fails to show any difference in the appearance of the iritic fibres in the paralyzed and the non-paralyzed area, and, as already stated, there is not the slightest disturbance of any other function of the eye. Evidently the nerve endings or filaments which supply the lower half of the iris have been permanently injured by the preceding inflammatory process.

CASE II. SYMMETRICAL CHANGES AT THE MACULA FOLLOWING IRITIS, PROBABLY DUE TO DEGENERATION OF THE RETINAL GANGLION CELLS.—In March, 1896, I called the attention of the Fellows of the Section to an unusual form of macular change which occurred in a woman, aged 55 years, one year after a severe attack of serous iritis. It was then described as follows:*

"Exactly at the center of the macular region was an oval, grayish red area, about one-third the size of the optic disc, and containing in its center two yellowish white dots. This spot was surrounded by a greenish ring, somewhat raised, so that the reddish portion appeared as if at the bottom of a small pit, the sides of which were composed of the greenish border described. The macular reflex was unusually distinct." The accompanying illustration, obtained from a water color made at that time and then exhibited, gives, as well as an uncolored picture can, the appearance of this peculiar spot.

Practically, no favorable result was reached by treatment, although the various alteratives—mercury, iodide of potassium, arsenic, etc.—were tried in succession. A little more than a year after the appearance of this lesion, namely, on March 1, 1897, the spot was still distinctly visible, and presented the characteristics already described, except that the greenish ring was no longer manifest, and the reddish part which had occupied the center of the circle was not quite so distinct.

The vision of the left eye had remained as good as ever it had been after the original attack of iritis, namely, 6/12, until this date, when it began to fail, and became 6/45. There were some vitreous opacities, one large semi-transparent one closely resembling a huge epithelial cell, but these opacities had been more or less constant ever since the original attack of iritis.

On the 23d of the same month an area of macular degeneration exactly like that which occurred in the right eye began to be visible, and in a few days assumed the characteristics which belong to the one upon the opposite side, so that the illustration then made is an equally good picture of the present lesion. Vision, however, on this side never sank quite as low as it did on the other, and at the last examination, about half a year ago, was 6/60, medication, as in the former instance, having had practically no effect upon the area of degeneration. The lesions were then exactly symmetrical.

In the first communication I suggested that the reddish material in the center of the area might be accounted for by the products of a hem-

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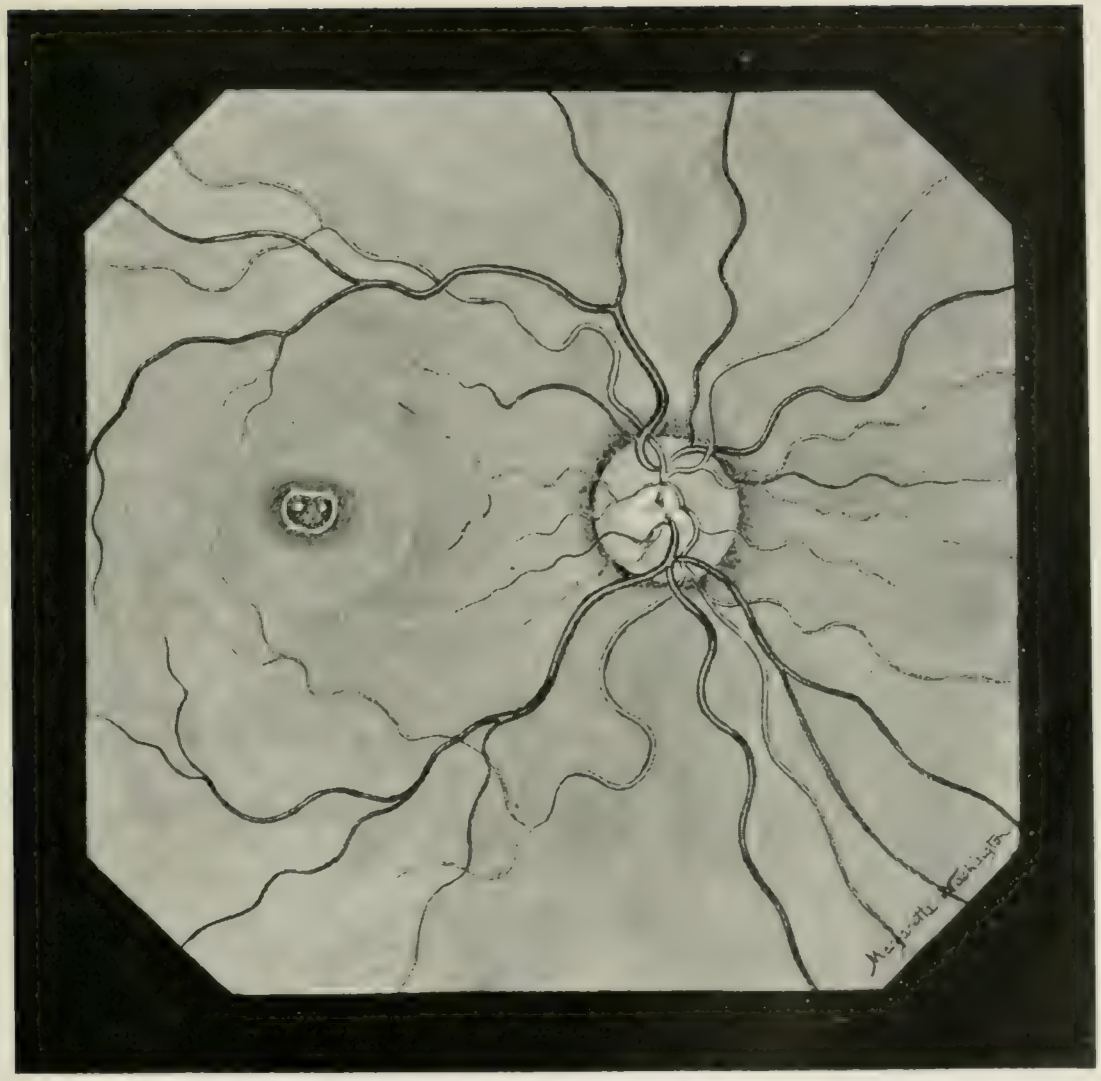
*1. The Philadelphia Polyclinic, Vol. V, 1896, No. 29.



orrhagic extravasation, but that the deep greenish ring which surrounded this mass was not readily explainable. In the absence of microscopic examination this explanation might be continued, but it is so evidently unsatisfactory that I wish to call attention to another and more probable hypothesis.

In the first place, the ophthalmoscopic appearances of the lesion are not those of a hemorrhage, which in my experience does not produce at any stage of its existence an oval, faintly granular, grayish-red area of this character. Moreover, I had the opportunity of seeing the second eye at short intervals just at the time when this appearance was developing, and there never was any sign of hemorrhage—only a gradual manifestation of this macular change. It is further suggestive that before the actual manifestation of the area of degeneration there was marked depreciation of vision, which would indicate that the percipient elements were undergoing changes which at that period no doubt would have been detected by the microscope but were not yet evident to the ophthalmoscope.

All of us are acquainted with the ophthalmoscopic picture of amaurotic family idiocy—the so-called symmetrical changes in the macula lutea, first described by Warren Tay. In these cases there is an oval, gray patch, larger than the optic disc, having a reddish spot in its center and somewhat resembling the cherry sport in the macula found after embolism of the central artery of the retina. Although for some time it has been known that degenerative changes could be found in the cells of the cortex of the brain in these infants, the earlier microscopic examinations of the eyes were unsatisfactory. It has fallen to the lot of Dr. Ward Holden, of New York,* to examine the eyes of a case of this character under the care of Dr. Hirsch, and to find by means of Nissl's stain extensive changes in the ganglion cells, which changes, to quote the author, "readily explain the fundus picture, which, indeed, admits no other anatomical explanation." To attribute the present macular changes in the yellow-spot region to analagous ganglion-cell alterations is perhaps warranted in the light of these investigations, but of course could not be proven unless opportunity were given for making sections through such a spot as this. Independently of the interest which centers in its pathological origin, clinically the lesion is a most interesting one, and so far as my experience goes, and I believe I am correct also in quoting the experience of Dr. Norris and Dr. Jackson, is unique.

*Journal of Nervous and Mental Diseases, July, 1898.

THE

OPHTHALMIC RECORD.

A MONTHLY REVIEW OF THE PROGRESS OF OPHTHALMOLOGY.

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EDITORIALS.

TESTS AND STUDIES OF THE OCULAR MUSCLES

Is the title of a new book by Ernest E. Maddox, M.D., which should be read by every one engaged in ophthalmic practice. Its pages (419) are full of interest and instruction. His description of the capsule of Tenon and the check ligaments is the clearest and best the writer has had an opportunity to read.

The work sets forth with comparative fullness all that is known of the function and errors of the extrinsic ocular muscles. His teaching relative to the management of muscle errors is very conservative, and probably this is best. That the author will change some of his views on this point and become bolder in his dealing with heterophoric conditions, this reviewer doubts not. While there may be other parts of this book with which the writer could not agree, a statement on page 146, concerning the exclusion test in the near, he believes misleading and incorrect. While the resetting in, on removing the cover, may occur in a great many persons, it cannot be considered a normal physiological condition. It occurs only in cases of exophoria and in asthenic orthophoria—it never occurs in sthenic orthophoria, nor can it possibly occur in esophoria.

In the book there is a great deal more to be praised than to be condemned. The author is specially happy in his suggestion that "superduction" and "subduction" be substituted for "sursumduction" and "deorsumduction." These new terms will go into general use at once. There are other new terms suggested by him that are equally appropriate.

As would be expected of Maddox by all who know him, to every original worker in the "muscle field" he has given due credit for his labors. This writer is grateful to him for his chapter on latent torsion (insufficiency of the obliques) and for his reference to oblique astigmatism.

G. C. S.

REPORTS OF SOCIETIES.

MEETING OF THE MEDICAL SOCIETY OF HAMBURG.

Translated and Abstracted from Die Ophthalmologische Klinik.

BY H. V. WÜRDEMANN, M.D.
OF MILWAUKEE, WIS.

Sænger spoke upon "*Hysteria and Nervousness in Children*," in which he laid stress upon the ocular symptoms and their relations to functional nervous disturbances. He distinguished three groups of nervous diseases in children, and in all found certain symptoms of the organ of vision. 1. Neurasthenia:—Out of 30,759 cases of eye diseases from the polyclinic there were 1,029 children with nervous asthenopia. The latter is often a portion of the general nervous condition which is not always recognized and often remains the principal symptom. Conjunctival or accommodative asthenopia has nothing to do with this. It does not come from central origin, but may be more often referred to retinal causes, which are connected with a deficient nutrition and lessening of the visual substance, as has been shown by Wilbrand. 2. Hysteria:—Blepharospasm of long duration without appreciable eye affection may occur in this condition, which sometimes may show as a form of ptosis. Hysteric ptosis is common enough, but hysteric amaurosis is less common. 3. The combination of neurasthenia and hysteric conditions:—In children this group shows itself ordinarily in connection with photophobia and a weakness of the eye for the near point, pain in eye, etc., diminished visual acuity and concentric contractions of the field of vision; also a neurasthenia of the eye, all of which Michel has called hysteric stigmata. The causes of these symptoms in children between ten to fourteen years of age are seen by Sænger to be too much forcing of work at school, poor hygienic surroundings, in anemic children of the poorer classes. These ocular symptoms are plain, as the eye is one of the first organs affected.

Liebrecht doubted very much the common occurrence of general hysteric eye symptoms. True hysteric eye symptoms are complicated with the occurrence of double vision, one-sided enlargement of the pupil with reaction, and sensory changes in the cornea and conjunctiva which often last for years.

Beselin recommended strongly the use of suggestion in these conditions in order to determine the cause of the disease, as well as to help in the diagnosis and therapy. Success is often obtained by the correction of the refraction, which improves the vision and cures the general condition. The development of the affection is caused through eye-strain, especially in astigmatism and hyperopia. The possibility of functional paralysis is to be considered in cases of paralysis of convergence and accommodation.

Franke condemned drugs and recommended the use of protective glasses and the stopping of school, for cure of muscular asthenopia. He excluded refractive and muscular disturbances, because through the correction of these alone further curative experiments are often rendered unnecessary.

Beselin showed the case of a 58-year-old man with *pulsating exophthalmos* which had arisen two months before from a fall on the head, which was attended by loss of consciousness and bleeding of the nose and right ear. The cause was an injury from a splinter of bone to the internal carotid within the cavernous sinus. Through this an arterio-venous aneurysm developed, which continued into the ophthalmic veins within the orbit. A rushing sound with pulsation in the left ear could be heard on the left side of the skull. The eye protruded 1.5 cm. There was paralysis of the levator, and the outer eye muscles caused by pressure upon the nerves and diminishment of sensation in the region supplied by the trigeminous, enlargement of the conjunctival and retinal veins, moderate diminishment of the visual acuity. By treatment for three weeks, six hours a day, of compression applied to the common carotid, there was improvement of the trouble and cessation of the exophthalmos.

MOSCOW OPHTHALMOLOGICAL SOCIETY.

Katalskaja showed a patient who had *injury of the eye with a hat-pin*, who had come to the physician three hours afterwards, when there was observed a small wound of the cornea, injury of the iris, slight opacity of the lens and bleeding into the vitreous and retina. Fingers could be counted at 3 m. The vision diminished and there was slight pericorneal injection. Less than a month later the vision improved, the cataract resorbed and the fundus was visible. At the site of the injury, where a large white spot was formerly seen, there now appeared two small grayish white plaques between which there was a narrow dark line. The author believes that this was a *superficial injury of the retina*.

Jerechkowitsch showed a patient who had a *splinter of steel in the eye* several months before, which was in the periphery of the vitreous, and was easily seen by the ophthalmoscope. This foreign body was removed through an incision 1½ m. through the sclera back of the cornea by the aid of the *Haab's large elecro-magnet* with good ultimate results.

Maklakow showed a case of *retinitis proliferans* in a patient 44 years of age, who had noticed loss of vision in the right eye for twenty years; while the left remained healthy. About four years ago the vision of the left eye began to decrease in much the same manner as that of the right. Externally nothing abnormal. Ophthalmoscopic examination: right papilla whitish, the outer portion covered over with a bluish white mass which projects into the vitreous. From this mass a white string proceeds which is connected to the periphery of the retina. In the periphery of the choroid there are atrophic plaques. These masses float about in the vitreous body, and the entire nerve head can be observed through them. They cover the outer portion of the papilla and project somewhat into the vitreous, and consist of newly-formed connective tissue, but no blood vessels. On the left side there was a neuritis with bleeding into the nerve head. The formation of new tissue in the vitreous was supposed to have occurred from bleeding of the retina following a neuritis. This was the most likely diagnosis, as in the second eye affected a neuritis with hemorrhages was to be observed.

Adelheim did not concur with the diagnosis of the speaker. The newly-formed membranes observed in the vitreous were connected only with such a thin string to the retina, and the theory could be attacked which placed the cause of the disease in the retina. Changes in the choroid are readily seen in this case, but the retina seems to be normal. All this speaks against diagnosis of retinitis proliferans. The appearances in this patient are certainly of interest, but should not be called by the name of proliferating retinitis.

Krukow: Although the connection between the retina and the new tissue formation is in this case but a very fine string of tissue, this condition does not speak against the diagnosis of retinitis proliferans. He had observed a case of retinitis proliferans from the beginning of the disease, which had arisen from hemorrhages and proceeded to new tissue formation, and this tissue ultimately bore but a slight relation to the retina, which must be the case in the present one. The connection of new tissue formation in its entire relations is unnecessary for the diagnosis. Notwithstanding the absence of blood vessels in the new tissue formation, the disease may be called retinitis proliferans as the new formed vessels may become obliterated.

Natanson thought that this case could not be properly classed under the head of retinitis proliferans. 1. Because the mass of connective tissue did not lie in relation to the retina in its entire extent, which for the before-mentioned diagnosis is absolutely necessary. 2. Because there were no new blood vessels visible. 3. On account of the existence of choroiditis. No cases of retinitis proliferans combined with choroiditis have yet been observed. This case was one of another kind, perhaps of a syphilitic nature, and should not be called retinitis proliferans.

Malakow believed in his diagnosis of retinitis proliferans. The new tissue was connected in two places with the retina. It is difficult to distinguish whether this connection did not exist in the entire extent, as a view back of the mass was impossible. If this was not a typical retinitis proliferans, then we had a disease which resembled it in a striking manner. Contrary to the statements of Adelheim and Natanson that the diagnosis of retinitis proliferans was not possible on account of the existence of choroiditis, Malakow believed that it was impossible to shut out the existence of choroiditis in the aforesaid disease, even if no cases of the combination have yet been reported, and that a choroiditis cannot well be excluded in connection with a proliferating retinitis.

Golowin: Retinitis proliferens is not well understood, and a number of retinal changes have been given the name. The patient under observation had changes in the retina similar to those of retinitis proliferans, and on account of this the case might well be called this disease. Until a scientific classification of such cases is made we must place cases which resemble each other in the same group.

When *Ewetsky* had first seen the case he did not call it retinitis proliferans, but later, after better observation, recognized it as this affection. It was not typical, but resembled retinitis proliferans so closely that this was the proper diagnosis to make.

Lawrentiew, in closing, spoke upon the *ophthalmic qualifications for Russian military service.*

MEETING MARCH 24, 1898.

Filatow showed a case of "*Congenital Anomalies of the Cornea and Iris.*" These anomalies consist of: 1. Microcornea and flattening of the corneal surfaces. 2. Corneal opacity. 3. Ectopia of the pupil combined with myosis. 4. Persistent pupillary membrane attached to the posterior wall of the cornea. Both eyes show exactly the same anomalies. The diameter of the cornea is 10 mm. The small flattened out cornea was clear in the center, but on the periphery there is a snow-white ring of opacity about 2 mm. wide, somewhat similar in appearance to the limbus. From this there proceed fine white rays. Through the anterior chamber the surface of the iris and the pupil may be observed. The pupil is very small, reacts to light and is of a vertical oval. The surface of the iris is uneven and of different colors. On the outer portion of the iris, there is a fine process, which communicates by thin string-like structures with the iris. The inner portion of the iris is not visible. It is covered over by a three-cornered membrane, whose wide base is obscured by opaque cornea and cannot be observed, but the point of which lies under the center of the clear cornea. The anterior surface of this membrane touches the posterior wall of the cornea, although the posterior surface is only connected with the iris in two places. From the point of this three-cornered membrane a fine string-like process proceeds outward which passes under to the iris.

Sneguirew. "*The Influence of Holocain upon Diffusion of Fluids from the Conjunctival Sac to the Anterior Chamber.*" The speaker had found by Bellarminoff's method that holocain favorably influenced and increased diffusion from the conjunctival sac into the anterior chamber, and concluded that the combination of holocain with atropin or eserin would produce more favorable results than when these drugs were combined with cocain.

Golowine. "*Intraocular Hemorrhage after Sæmisch's Operation.*" In the case of a patient with ulcus serpens corneæ, in which there was hypopion half filling the anterior chamber, the author made a keratotomy, the cut being 4 mm. in diameter. The outflowing pus tore the iris. During this it appeared as if a round mass of the iris would be forced forward; the lens immediately came forward, so that it was difficult to keep the edges of the lens from being injured during the operation. The bandage had to be changed one-half hour later, as it was entirely soaked with blood. In a couple of hours the bleeding stopped, and the patient was enabled to leave the clinic in a few days. The little mass which came out of the eye was determined upon microscopic examination to be composed of the ocular membranes of the iris, choroid, etc.

Natanson did not think that this sort of a case had ever been described. Intraocular bleeding is somewhat common after extraction of cataract, and he remembered a case of Schweigger's, in which one day after a clean cataract extraction prolapse of the iris occurred, which had to be cut away, and after this operation, intraocular bleeding followed.

Maklakow—"*Proliferating Retinitis*"—gave a short resumé of the literature, and showed that for a diagnosis it was not necessary to prove the entire attachment of the newly-formed membrane to the retina. Often the blood vessels are not to be observed, and likewise the occurrence of choroiditis, with proliferating retinitis in the same eye, has often been described. The case which he had reported at the last meeting of the society was not supported. In closing M. quoted Blessig, who had seen the same case which M. described. Blessig wrote that the choroiditis had been observed to develope within the last five years, and that the newly-formed tissue had become more translucent, and its extent had lessened.

Adelheim believed that the changes which had occurred in the eye of Maklakow's patient should not be described under the name of proliferating retinitis. The diagnosis of proliferating retinitis should only be made of a typical condition. Lesions such as Maklakow's patient had should be named differently.

Golowine had concluded since the report of Maklakow that this was a case of proliferating retinitis, and that the remarks that were made in the last meeting against this diagnosis were not supported by the facts.

CHICAGO OPHTHALMOLOGICAL AND OTOLOGICAL SOCIETY.

Regular Meeting, October 11th, 1898.

Dr. W. Franklin Coleman in the chair.

Dr. Coleman exhibited a patient on whom he had performed *Mules' Operation* two weeks previous and put in an artificial eye two days ago, and it has been worn now forty-eight hours comfortably. The excursion of the eye is twenty-five degrees up and down and twenty degrees out. The patient is a miner, who six weeks ago, in the course of his work, received a blow from a stone on his left eye. It was quiet when he came to see me on the 20th. By the 26th there was considerable reaction, and tenderness upon pressure in the upper ciliary region. There was a cut through the cornea extending into the ciliary body, and he found that it was advisable to remove the eye on account of sympathetic irritation. He had in a previous case inserted a ball in the conjunctival sac, and never saw an enucleation followed by less reaction. There was no edema of the lids and the man went out of the hospital within a week, and the eye was perfectly quiet.

In this case Dr. Coleman eviscerated the eye in the usual way, and hen made an incision above and below vertically in the sclera, irrigated the scleral cup with very hot water until the hemorrhage ceased and then cauterized the inner wall of the sclera with ninety-five per cent carbolic acid, then inserted a medium sized globe, sutured the sclera vertically, and the conjunctiva horizontally, and then irrigated very freely with two gallons of hot water, and left directions that hot water be applied every alternate half hour. The first day there was excruciating pain, and moderate pain for forty-eight hours after. The first day the edema of the lid was very great, but it was very much reduced the following day. From descriptions of Mules' operation he infers that there is usually a great deal of reaction. We all will accede to the statement that evisceration is followed by much more reaction than enucleation. Dr. Coleman considered the reaction in this case unusually moderate, and attributed it to two things: In the first place, the cauterizing of the sclera; and, secondly, to the free irrigation with hot water.

The important question is, then, as to the matter of safety. Dr. Allport (*Annals of Ophthalmology*) says evisceration is followed by such unfortunate sympathetic results that he was induced to experiment with the Mules' operation, and is quite in favor of it. Dr. Coleman cannot see that if evisceration is not safe as a protection, that putting a ball in the sclera will add to the safety. He does not know that statistics show evisceration to be less safe than enucleation. Dr. Hotz reports an unforunate case of sympathy following evisceration, but there are in our report thirty sympathetic cases following enucleation. Knapp says that abroad the majority reported against Mules' operation. That in some cases—a small per cent—the ball was extruded, and he quotes Zermack as saying that the operation is a failure; that sooner or later the foreign body would be extruded. All the symptoms of sympathy in this case have disappeared.

Dr. Hotz has had no personal experience with Mules' operation. The effect of these operations, as far as the motility of the artificial eye is concerned, does not seem to be any greater than that of an enucleation or an evisceration.

When in Philadelphia last year Dr. Fox, who, as we know, is an ardent advocate of this operation, took particular pains to convert him. He had collected in his hospital about eight cases of Mules' operation, eight patients on whom the operation had been done at various times. Some had been wearing the artificial eye and the artificial vitreous for over two years. This fact would certainly show that the glass ball is well tolerated, and it stands to reason that if it has been worn over two years, that it will remain there and not be extruded later on. The scar over the glass ball was smooth and firm—showed no tendency of expansion. The results in this respect were very satisfactory.

But as to the movements of the artificial eye—as to the cosmetic effect, he must say that if the eye showed good motility it was a small artificial eye and looked sunken, and if the eye looked nice and full, the motility was very limited, and in the case shown here to-night, the outward movement of the glass eye is very limited, and the inward movement is no better than he has seen in glass eyes on enucleation or simple evisceration stumps. But one thing struck him as a cosmetic advantage, and it is very noticeable in this patient, and that is the absence of that deep, hideous, sinking in of the upper lid, which we all know is unavoidable and quite conspicuous after an enucleation. You could notice in this case that the contours of the upper lid seem about the same in both eyes, so that the expression of the eye is quite natural, and its form much better than we find it with a glass eye inserted after an enucleation. The artificial eye stands out better; there is no question about it, and this is the only cosmetic advantage to be gained by the insertion of the artificial vitreous.

Dr. Casey Wood, some nine years ago, did Mules' operation on two patients after observing favorable results in clinics abroad. One of the cases did well until he lost sight of him a few months afterward; in the second instance, the glass ball was promptly extruded. Observation of these two cases and of others in the service of brother ophthalmologists convince Dr. Wood that just as much as one produces the desired cosmetic effect of a prominent artificial eye, just so much does he bring pressure to bear on the anterior structures that must be depended upon to hold the sphere in place. To that extent, consequently, is there a liability to absorption of the parts in front of the artificial vitreous and to the eventual extrusion of the globe. He concludes that inasmuch as the thing that seems to be desired is the principal source of subsequent danger and failure, there is very little in the procedure to recommend it as an operation preferable to a properly executed enucleation or evisceration. At the last meeting of the *American Medical Association* in Denver this year, Dr. Wood was much interested in some hollow aluminum balls exhibited by Bryant, of Omaha, out of which segments had been cut, so that when introduced either into the globe itself or into the orbit after an excision, the surrounding tissues entered the openings and held the ball firmly in place. It is a device correct in theory and efficient in practice, and seems in every respect superior to the ordinary glass balls. These aluminum spheres may be inserted into the exenterated globe, or they may be placed directly within the orbit. We thus not only obtain a prominence upon which to adjust an artificial eye, but we have it held firmly in place. The pressure of the anterior segment is so slight that with ordinary care there is little or no danger of conjunctival absorption, and, as a consequence, safety from extension of the globe.

Dr. Casey Wood presented two cases (father and daughter) of *congenital distichiasis.* Both patients exhibit absolute normal lids apart from these supernumerary cilia. In both cases the second row is of fine, white hairs, on the inner margins of both lids—few of them impinging on the cornea. The latter is free of opacity, and the conjunctivæ are practically normal. Occasionally some lashes touch the corneal surface, and have to be extracted. There is a plain history of both patients having exhibited the condition from early infancy.

Dr. Hotz mentioned a case where there was a row of eyelashes coming out directly from the posterior lip of the margin—faint, fine-looking hairs protruding from the lid only about ⅛ inch. They came out very easily; it took very slight force to pull them out, and to his great surprise the hairs were as long as regular eyelashes after their removal; and it seemed to him that they arose from the meibomian ducts, and after being extracted a few times they stopped growing. In this case, where the hairs grow again so persistently after epilation Dr. Hotz would dispose of these eyelashes by electrolytic treatment.

Dr. Casey Wood said he intended to employ a somewhat different method from that suggested by Dr. Hotz, although he agreed with him that the cases were not suitable for any of the ordinary operations for trichiasis. He would take a couple of fine wooden tooth picks and by sharpening them carefully, make them very sharp and very hard. With the visual aid of a powerful lens, he would drill a hole alongside the lash into the follicle; the second toothpick is dipped into fuming nitric acid and inserted alongside of the first one. That is a plan easy to carry out. It does not hurt the patient very much, less than electrolysis, and it thoroughly destroys the follicle.

Dr. Hotz reported a case in which there had appeared well marked *untoward effects of mydriatics.* On the 15th of August he was called to see a gentleman about sixty years old who had been under the care of

Dr. Thompson of Indianapolis for an inflammation of the right eye. Five years previous he had had an attack of iritis in the same eye, and the physician who treated him then informed Dr. Thompson that atropine had caused a very violent inflammation of the skin; on that account Dr. Thompson did not prescribe atropine, but a weak solution of scopolamin. The patient himself told Dr. Hotz that when he had iritis the first time his face was swollen and he suffered more from the trouble of the skin than from the eye. He had not used the scopolamin prescribed, but simply made warm applications to the eye. There was no swelling of the lids, no irritation of the conjunctiva, no discharge, but the eyeball was intensely red, the cornea smoky, the iris discolored and swollen, and the pupil contracted to its utmost. Dr. Hotz, being anxious to test the mydriatic, used the solution of scopolamin prescribed by Dr. Thompson and dropped it in the eye several times while at the house, to obtain the dilatation of the pupil. It dilated slowly and irregularly on account of posterior synechiæ. The solution was ordered to be used every three hours and to report next day. The next day the injection of the eyeball was less, but the lids were œdematous and red. The pupil was not satisfactorily dilated; it was therefore decided to stop the weak solution of scopolamin, and to use duboisine instead, a solution of two grains to the ounce every three hours. Under this the pupil dilated satisfactorily, but the lids were exceedingly swollen, the conjunctiva discharged a good deal of mucous, the lower lid and the upper part of the cheek were puffed and at places serum exuded from the skin. The duboisine was, however, continued and an ointment given to apply to the skin, hoping that we might possibly counteract the irritating effect of the mydriatic. But the swelling of the face went on, so that in another twenty-four hours the whole right side of his face was intensely swollen. The skin furrows were deep and eroded; crusts of dried secretions formed everywhere, and the conjunctiva discharged a good deal; but fortunately the iritis subsided very readily, so that in a few days, the inflammation of the eye was practically gone. He was first seen on the 15th, and on the 19th the condition of the eyeball was so satisfactory that the duboisine was discontinued, and within the next twenty-four hours the face began to improve. He had no return of the iritis, and by the 24th of August the pupil responded readily, and the eczematous condition of the face and the swelling of the lids had entirely disappeared. *He did not suffer from any general constitutional symptoms.

*In Vol. III, p. 65, of Norris & Oliver's System of Diseases of the Eye, Dr. G. C. Harlan mentions a similar case of severe dermatitis resulting from the application of duboisine.

Dr. Colburn has had almost the same experience in a case of cataract extraction. About two years ago he operated upon the left eye, and atropine produced all the symptoms that Dr. Hotz has described. Last winter the right eye was operated upon, using duboisine instead of the atropine, with the reappearance of the untoward symptoms. The lids were distended, the nostrils and both eyes closed, and involvment of the whole of face and neck. It was a most fearful case of apparent erysipelas. The recovery from the operation was not interfered with, the visual result good.

Dr. Casey Wood reminded the members that in every case of well marked atropine conjunctivitis that there is a disposition to inflammation of skin and mucous membranes from the local application of belladonna and its alkaloids—a sort of dermal idiosyncrasy. He had made experiments in this direction and found that the subjects of atropine conjunctivitis showed a distinct dermatitis when the atropine solution was rubbed on the skin of the arm, leg, thorax, etc.

Dr. Pinckard had had one case where a single drop of atropine, duboisine, or hyoscine brought on very marked constitutional symptoms, but not any skin symptoms. The patient was a woman about thirty years of age.

Dr. C. P. Pinckard reported a case of *Sarcoma of the Lid* in a woman thirty years of age, first seen in May of this year. Two months previous she had noticed a swelling on the lower lid, just to the outer side of the punctum, which gradually increased in size. It was then about the size of a very large pea, the skin being a trifle reddened, and the conjunctiva a dark red color. In appearance it resembled a chalazion and its removal advised. On making an incision into the tumor, however, it was found to be solid, a section of which on examination proved to be sarcoma, the specimens of which were shown microscopically.

The question of the differential diagnosis is certainly very difficult. The only peculiarity that Dr. Pinckard noticed and which probably should not have noticed but for the subsequent developments, was that the border of the lid was very much raised at the site of the tumor, thus disturbing the line of the lower lid. This is not the case with chalazion, the swelling generally extending only outward or inward, and not interfering with the line of the lid border.

The patient was sent to the hospital, and under ether a large V-shaped incision, beginning at the inner canthus and to the outer side of the middle of the lid and joining about an inch below the lid, was made, and the whole section removed.

The caruncle, the lachrymal sac and some of the orbital tissue were also removed. The outer half of the lid was joined to the skin of the nose and healed readily by first intention, leaving but a comparatively slight scar. Some few weeks later at the site of the scar there was a suspicious looking growth, which was thought to be the probable return of the sarcoma, that has now disappeared.

Dr. Pinckard thinks it impossible, in many cases, to make a differential diagnosis between sarcoma and chalazion before a section is made into the tumor. Certainly in this case, with the possible exception of the lid edge, there was nothing characteristic. The patient was healthy in all other respects, and no doubt this was a primary sarcoma of the lid.

Dr. Wescott had made one observation of tumor of the lid, not sarcoma, that may be of interest in this connection. A child was brought early in the summer with quite a considerable tumor of one upper lid. It extended almost the entire length of the tarsus, which it covered very completely. The child was about three years of age, and had been presented to Dr. E. L. Holmes when it was six months old. It then had a small tumor, which he took to be a chalazion, and was surprised when he cut through the skin to find a solid tumor. He split it to the tarsus and then curetted, thinking that he had removed the entire growth. It returned very slowly, and had been growing up to the time that the child was brought to Dr. Wescott. No difficulty was found in dissecting the tumor and the orbicularis from the tarsus, leaving a perfectly clean, dry cavity. The operation was done about five months ago. The patient was heard from a month ago when there has been absolutely no sign of return. Dr. Hektoen, who examined the sections of tumor, pronounced it as a true angioma.

In the discussion of *Dressings of Cataract Cases*, Dr. Coleman said in the last three cases he did not apply a compress bandage; simply put on a gauze shade, suspended by plaster on the forehead, and covered that with a papier maché shield, and has never had much reaction.

In a discussion on *Iridectomy in Cataract Extraction*, Dr. Coleman said Landolt has probably written the best article of late years on cataract extraction, and he says that beyond all controversy preliminary iridectomy offers the safest prospect of recovery. All things considered, Dr. Coleman prefers preliminary iridectomy as affording the greatest amount of success.

Dr. Coleman said he questioned the efficacy of using eserine in the simple operation. He would not use eserine to prevent prolapse, but atropine. The latter, by opening the gateway, takes the pressure of the aqueous off from the posterior surface of the iris and thus prevents prolapse.

Dr. Hotz has never divided the operation to save the patient annoyance and nervous excitement of two operations, when he can get along with one. He does not know whether there would be anything gained by, or any greater safety in, the preliminary operation.

Dr. Bulson, of Fort Wayne, in the discussion of a paper that was presented at the recent meeting of the *British Medical Association*, a noted ophthalmologist cited a case in which the wound, following removal of cataract, remained open for seven or eight days. This was supposed to be due to the fact that the incision had been made wholly in corneal tissue, which in the aged repairs slowly.

Dr. Bulson recently had under his care a similar case in which, owing to the unruliness of the patient, the incision was made wholly in the cornea. This wound remained open, with escape of aqueous, for a period of five days; and, notwithstanding the fact that a small iridectomy was performed, no prolapse occurred. Under pressure bandage and the stimulating effect of hot compresses the wound closed very nicely.

As to the use of eserine, he did not presume to speak from a great amount of experience, as he used the drug in exceptional cases only. He believed it to be irritating in a large percentage of cases and therefore prefered to limit its use as much as possible. He had seen weak solutions produce violent irritation, and for that reason has learned to look upon all applications of eserine with considerable suspicion.

Dr. Wescott is still doing the combined operation and hesitates to change. He has also seen decided irritation from a half-grain solution of eserine, and his ordinary prescription is an eighth or a quarter to the ounce. He believes in using atropine after extraction, but does not begin it early, and frequently has omitted it until the fourth day.

Dr. Pinckard: When house officer in the Infirmary in Boston, Dr. Chandler devised an operation and operated on fifty cases with a device which was quite ingenious. He argued that the prolapse of the iris was due to the gushing forth of the aqueous, carrying the iris with it. So after doing his extraction, he cut a small piece, the size of a pin-head, out of the peripheral edge of the iris. The idea is certainly ingenious, and was probably original with him. By this means he left the pupil round, and that part of the iris with the hole in it was always covered by the upper lid, and through this hole fluids could pass to the anterior chamber and thus diminish the danger of prolapse.

Dr. Robertson of Davenport, Iowa: After operations for cataract it is desirable to have as small a clear pupil as possible. Whether you do a simple or a modified operation, there is nearly always some secondary cataract developed, and it is desirable to have a pin-hole pupil through the secondary, for the reason that you get a greater range of accommodation. The larger your pupil, the less accommodating power you have left in the eye. There is one case I recall where the man had accommodation enough to see at a distance and read with the same lens. This is of course not on account of any true accommodation, but by reason of the pin-hole pupil, all rays of light entering the eye being practically parallel. These patients can, by squinting the eye, make pressure on the globe by the lids so that the eyeball is elongated by mechanical force. This would of course create an artificial myopia, and in such a way give the patient an artificial accommodation. This artificial myopia can exist to an unknown amount, and we are not unwilling to concede that we might develop 3.00 D. or 5.00 D., which would be changing the diameter of the eye only 1mm., or 1¾mm. He does not think it makes much difference when you fit the patient after extraction, as some will wear the same correction always, while others require changing often.

Dr. Wescott had one traumatic case of cataract in a boy where he did a very small iridectomy and got vision of 20/40 with the proper lens. With the same lens the boy could read the smallest type. He ascribed this power to the very small pupil.

Dr. Coleman, in the *Discussion on Capsulotomy*, said he should not be tempted to use a forceps except when a tough capsule is present and is then very decidedly in favor of using the forceps, and in the few instances in which he had had occasion to use them the result has been most satisfactory. He does not see why some of the text-books should recommend removing the capsule subsequently to removing the lens. That seems a very dangerous proceeding.

Dr. Hotz' experience is somewhat unique. In all his extractions he has never come across any capsule that he could not cut with a cystotome. If he should encounter one that the cystotome should fail to cut, he would rather remove the cataract in the capsule *a la Pagenstecher*.

Dr. Hotz, in the *Discussion on Secondary Operation*, dislikes to do secondary operations, and if a patient has anywhere near satisfactory vision does not perform them for the sake of getting better vision. He cannot understand how any one can advocate them so persistently as if they were the simplest and most harmless operations. No matter what instrument may be used, the mechanical action certainly is not so much cutting as tearing. We have very little chance to cut a capsule, and he has found that the membrane will yield before the knife until it tears. If the membrane is very thin no serious reaction follows, but if at all thick the reaction is severe. In cases of dense membrane he is in the habit of using two fine, sharp hooks, introduced through the cornea, and tearing the capsule in the center. As the traction of one hook resists the other, there is no dragging on the ciliary region. Even in cases of thin membrane he has seen violent reaction follow the secondary operation and has been able to demonstrate the presence of a small thread of vitreous in the hole in the capsule.

Dr. Coleman most heartily agrees with what Dr. Hotz has said. While the knife needle in his hands has been followed by unfortunate results, he has quite frequently operated on tough membranes with the de Wecker scissors, and always with gratifying success, a good pupil having been secured and with very little reaction.

Dr. Pinckard has often seen the operation referred to by Dr. Hotz done in Boston, particularly by Dr. Jeffries. Usually but one hook was used, the other point of traction being a Bowman needle. The needle was passed through the cornea and into the center of the capsule and then a hook introduced from the opposite side and a tear made with the needle as a point of resistance.

Dr. Wescott has accomplished the same thing by introducing two needles on opposite sides of the cornea into the center of the capsule and thus tearing the capsule.

In the discussion of *Prescribing of Glasses after Cataract Extraction*, Dr. Westcott said, we have to be guided in these matters very largely by the means of our patients. A good many, especially those from the country, are very anxious, for more than one reason, to return as soon as possible, and they want some sort of a glass when they go home. He has been in the habit of measuring the refraction carefully between the end of the second week and the beginning of the fourth week, and has given the patient the spherical lens which gave him the best vision; has asked some of these patients to come back in three or four months, and in more than one instance he has been able to give a permanent glass at the end of sixty days, that was still the best glass accepted within a year.

In other cases, one of which he now has in mind, he found a very decided change at the end of a year. He extracted a cataract in Minnesota last September, the patient was left two or three weeks after the extraction, and he accepted then a +9 sphere with a +4 cylinder. He was given a +9 sphere to wear and was perfectly satisfied, except that he could not read. This year the patient was found to have even less vision, 20/100, with the best correction which could be given him, which was a +12 sphere and a +4 cylinder. In the dark room it was found that the posterior capsule was thrown into fine vertical folds. The anterior capsule was out of the way entirely. A needling was performed on the following day. After a week's time, during which there was absolutely no reaction, the patient accepted the same correction, but got 20/30 vision, and was able to read his newspaper. If we could see all of our cataract patients once a month for a year we might be able to decide this question.

Dr. Wescott asks his patients to stay in town a month when they come from outside for cataract extraction. Then he asks them to come back in three months, and then again in six months, if the glasses are not perfectly satisfactory for all purposes, and in that way he has given some patients better satisfaction than if any definite time were set for giving final correction.

Babcock directs that yellow oxide ointment should be prepared as follows, as he believes decomposition and precipitation of mercury will be prevented.

℞—English Graphite,	gr. x.
Hydrarg. Oxid. flav.	gr. xx–x.
Oleum Theobromae,	q. s.
Butter of Antimony,	gtt. ii.

Mix and make into pencils.

Manin recommends the following for loss of eyelashes due to syphilis.

(1) ℞—Glycerin.	200 parts.
Ext. Krameria,	15 "
Calcium Iodide,	10 "
Iodine,	1 "

M. Sig. One teaspoonful every morning in a half glass of water.

(2) ℞—Pilocarpine nit.	¾ grains.
White prec.	3½ "
Vaseline,	225 "

M. Sig. A piece as large as a grain of wheat, to be rubbed on the edges of the lids (the lid being closed) every night and morning.

REVIEW.

I. THE ANATOMICAL CHANGES IN THE EYE CAUSED BY SYPHILIS.—By Dr. med. Karl Baas, in Freiburg i. Br. *Archiv für Ophthalmologie, Band* XLV, 3.

II. SCROFULA OF THE EYE WITH ESPECIAL REFERENCE TO THE QUESTION OF SEX AND AGE.—(From the clinic of Prof. Magnus in Breslau.) By Dr. Emil Guttmann. *Deutsche med. Wochenschr*, August 25, 1898.

A report by Robert L. Randolph, M.D., Baltimore.

The author mentions the frequency with which eye symptoms accompany syphilis, and also how suggestive certain of these symptoms are of syphilis. Not only is syphilis manifested in external affections of the eye as in keratitis, but also in deep-seated diseases as choroiditis, retinitis, etc. There is, however, a lack in our knowledge of the anatomical changes in the eye resulting from syphilitic infection. Quite a complete record is given of those who have made contributions to this aspect of the question, commencing with Hutchinson (1860), A. von Graefe (1861), and ending with Dor and Elschnig in 1896 and 1897, respectively. He reports four cases where he had an opportunity of making an anatomical examination of the eyes, and in all of them the diagnosis of syphilis had been well established. The conjunctival changes consisted, first of all, in alterations in the blood vessels. The changes were most marked in the intima, and consisted chiefly in endarteritic proliferations. Elschnig has observed the formation of new blood vessels. Changes in the lymphatics were observed only once. While Elschnig reports hyperplasia of the connective tissue cells, Baas has observed simply an induration of the tissue. Clumps of round cells and areas of round cell infiltration were often seen, these areas not infrequently extending right into the epithelium. The changes in the epithelium are to be regarded as secondary, and consist in a dropsy of this membrane with a mucoid degeneration of the cells, and in one case there was an exfoliation of the upper layers of epithelium. As regards the conjunctival changes, Mauthner has observed obstinate conjunctivitis, which has later on been followed by iritis. It is evident from this that we have here a so-called idiopathic disease of peculiar character, differing widely from those changes seen in the ordinary conjunctivitis.

Changes in the cornea: These consist principally in the formation of new blood vessels. Hirschberg is of the opinion that these blood vessels never disappear, but that they may always be seen with a strong lens. This view is confirmed by the observations of Baas.

Changes in the sclera are not frequent, and this may be accounted for by the relative scarcity of blood vessels in this location. It may be said, however, that secondary round cell infiltration has been seen by v. Hippel, Delafield and Scherl. The same reasoning applies to the cornea, and Stellwag thinks that the changes here are always secondary to those in the uvea.

We all know that iritis is a secondary manifestation, and that the so-called gummous iritis is really iritis papulosa. Virchow has expressed the opinion that it is impossible in all cases to distinguish with the microscope between the anatomical products of secondary and tertiary syphilis. We do not possess, then, sufficiently trustworthy microscopic evidences, or rather proofs, to enable us to say always, here we have secondary changes and there tertiary changes. So much more valuable, then, becomes the clinical aspect of the question. What we used to regard as a gumma is in the light of our better knowledge now considered a condyloma. Baas found nodular thickenings throughout the iris, and proliferations upon the sphincter and in the ciliary region.

The changes in the vitreous body consisted in an increase in the so-called vitreous cells and leucocitic elements. Liquefaction of the vitreous is not infrequently found so, also fabrillary degeneration of the same.

The choroidal changes, according to the investigations of Baas, are found usually in the chorio-capillaris, consisting in a lymphoid infiltration in this locality, associated in the outer layers with numerous foci of round cell infiltration. Some have thought that the nodules are invariably found next to the blood vessels or in the intervascular spaces, but this view was not confirmed by Baas. The latter was struck by the fact that the cell infiltration was much more intense near the entrance of the optic nerve than in the anterior and equatorial parts of the choroid. The stroma does not participate to any great extent in the inflammation. The stroma cells showed changes chiefly in shape. The vascular changes, however, were most marked. Here were found vegetations in the intima with hyperplasia of the endothelium and sclerotic thickenings in the adventitia of the vessel wall. It is a well known fact that after all other manifestations of syphilis have passed away another attack of inflammation may occur in the uvea, and often does occur. In all the cases in which Baas made an anatomical examination the patients had been free from luetic disturbances for years and yet the histological examination revealed the most intense and active inflammatory changes.

Changes in the retina were observed in all those cases where choroidal changes had been present. Both Bach and Appel think that it is quite possible for the retina to be affected alone in such cases, but it must be said that they are alone in this opinion. First of all, we have the changes in the vessel walls, with the appearance of which we are familiar from the works of Hutchinson, Brailey, Uhthoff and others. Foci of infiltration are described by Hutchinson and V. Hippel, while Brailey and Uhthoff describe more diffuse changes. Neumann speaks of a growth or proliferation of pigment epithelium, while Fuchs reports the presence of glandular formations and atrophy of the nerve fibre layer with widening of the lymph spaces. Baas concludes that the so-called retinitis centralis i really a chorio-retinitis. To sum up, the changes in the retina we have serous infiltration and areas of increased nucleation. These retinal foci are not gummata. While the anatomical examination would suggest that it was possible for the retina to be involved alone, as yet there is nothing to prove this. In other words in all the cases reported by Baas the choroid was involved, and it is exceedingly likely that the changes in the retina in this class of cases are always secondary to those in the choroid.

The optic nerve changes consisted partly in an increase in the connective tissue corpuscles of the septa. This condition was present at the intraocular end of the optic nerve, as one might suppose from the location of the choroidal changes. It should be said, too, that these changes extended right into the lamina cribrosa. In fresh cases round cell infiltration was always present, this infiltration diminishing in intensity backward, and being most marked in the region of the papilla. In the inter-vaginal space there was at its anterior end a proliferation of the endothelial parietal cells. All these changes are to be explained by the intimate vascular connection between the nerve head and that part of the choroid where the pathological changes were most marked. The changes in the vascular system of the optic nerve were most pronounced.

II.

Guttmann speaks of the more or less mystery surrounding the word scrofula. In early times this was not so, the condition then being regarded as a distinct constitutional affection depending upon a well-defined dyscrasia. Since so much light has been thrown upon the nature of infectious diseases it has dawned upon us that what we call the scrofulous diathesis possesses no characteristic pathological products, and that the term is a vague one. Yet from a clinical and practical point of view the term is a satisfactory one to apply to a certain set of symptoms which are constantly recurring, and whose causes, to say the least, are obscure. When we use the word we have in our mind's eye a young person, in fact a child badly nourished, pale with enlarged cervical glands, eczema of the face and head, chronic inflammation of the nasal mucus membrane and of the ear, and lastly with obstinate eye trouble, characterized particularly by photophobia. Guttmann has had exceptional opportunities of studying the scrofulous affections of the eye, and his conclusions are drawn from observations made in the clinic of Professor Magnus in Breslau. He regards as scrofulous ophthalmia:

1. Phlyctenular conjunctivitis.
2. All cases of superficial keratitis, with the exception of traumatic, and of those which may be regarded as keratitis superficialis, marginalis, herpetica, etc.
3. All cases of follicular keratitis and pannus scrofulosa.
4. Cases of eczematous catarrh, *i. e.* muco-purulent catarrh.

Among forty thousand eye patients there were 6,550 affected with eczematous kerato-conjuctivitis, and among these 2,157 were males and 4,393 were females; in other words more than two-thirds of those affected with scrofulous ophthalmia were females. As regards the special kind of affection:

Phlyctenular conjunctivitis, 3,873.
Muco-purulent catarrh, 161.
Keratitis eczematosa, 2,516.

It would seem from this that the female sex were twice as liable to this variety of eye trouble as the male. Of the forty thousand patients 15,052 were children, and of these latter 1,700 boys and 3,370 girls were affected with scrofulous eye trouble. The author then proceeds to give tables of the number of patients seen between certain periods in the clinics of Wicherkicwicz, Schreiber, Sattler and Kerschbaumer. An analysis of this material served to confirm in both points the results of Guttmann's observations, namely: that most of the patients affected with scrofulous ophthalmia were children, and that the females were almost twice as numerous as the males. He sums up his interesting study as follows:

Patients with scrofulous kerato-conjunctivitis constitute about one-sixth of all eye patients, and among children up to the fifteenth year nearly one-third. As regards sex the female on an average furnishes nearly twice as many as the male. These affections begin about the middle of the first year, increase in frequency up to the fourth year, and thereafter become less frequent. The most liable time is between the first and second dentition. With increasing age the male sex loses more than the female sex the disposition to scrofulous ophthalmia.

CORRESPONDENCE.

To the Ophthalmic Record:

I append a short report of a clinical observation which may serve as a slight contribution to our knowledge of the relative effects of cocain and holocain.

In experimenting with cocain and holocain upon the normal conjunctivæ of seventy-five individuals, report as follows: Cocain was dropped into one eye and holocain into the other. In fifty-one cases the holocain smarted the most, while in ten cases the eye into which the cocain had been instilled was the more painful. In fourteen cases the person was unable to decide. In no case was there any objective difference.

Robert L. Randolph.

To the Ophthalmic Record: In the October number of the Ophthalmic Record I directed attention to "A New Treatment for Trachoma." Dr. Neiswanger of Chicago, in a letter to me, claims priority and has submitted proof that he published in the Alkaloidal Clinic, in 1895, a similar treatment. My work was independently done and without any knowledge of his. To him is due the priority in calling the attention of the practitioners to the treatment. Trusting that this little note does proper justice, I remain, Very fraternally,

George F. Keiper.

"THE EDUCATION OF THE OPHTHALMOLOGIST."

To the Editor:—In the current (October) number of the Ophthalmic Record is an editorial over the initials F. B. E., to which I, as well as every thinking ophthalmologist, I believe, must take decided exception.

When an editorial writer of what we, the readers, have learned to look upon as a journal seeking to elevate the standard of our chosen and honorable profession, deliberately teaches that "with a ground-work of physiology, chemistry, physics, and mathematics those branches of ophthalmology peculiar to itself can be mastered in a university preliminary medical course, and the time spent in a medical college actually shortened," it takes away one's breath and one wonders whether this is really the latter part of the nineteenth century.

Why not omit physiology and chemistry in the teaching of those branches of ophthalmology peculiar to itself? Refraction, in the sense of measurement of the individual eye as an optical instrument, is the only branch of ophthalmology entirely independent of general bodily conditions, and this can be said, only when the refractive apparatus is in a state of absolute rest. The merest tyro knows that at all other times the correction of abnormal refraction is intimately dependent on the general physical condition of the patient.

The neurologist asserts, with reason, that the retina is but an extended portion of the brain, the outpost as it were. It is governed by the same physiological laws as the rest of the nervous system, modified in accordance with its peculiar environment. The lens is a modified portion of the skin and has its own special functions. Will any one presume to affirm that a thorough knowledge of the laws which govern the body in general is not a vital necessity in treating affections of the retina or lens?

I combat the assertion of the writer with all the vigor at my disposal that "Ophthalmology is peculiar to itself in respect to the study of ocular physiology and dioptrics, light and color perception, binocular vision, etc., and **no amount of experience in other departments of medicine is of the slightest assistance in understanding them.*" That is exactly what the numerous optical colleges with their two or four weeks courses, which disgrace our country, are teaching. The opticians and "refractionists" all agree with F. B. E. here. But surely a well-equipped oculist would spurn to have such sentiments govern him. Does the gynecologist not have a field peculiar to himself, and is not experience in other departments of medicine of the very greatest value to him?

The specialist should be a well-rounded out man with years of experience in general medicine behind him before venturing to embark in any specialty, and especially is this true in the extremely important one of ophthalmology. We need broad-minded, level-headed, painstaking men in this age when the tendency is so toward fads, fancies, and hobbies. The man who cures all cases of epilepsy by correcting hypermetropia is just as ignorant or just as dishonest as the osteopath who does it by rupturing a stiffened tendon or massaging a joint. A sound *general* medical education and practice of some years would drive such nonsense out of the head of any man of average intelligence. The well-grounded progresive physician does not drop into a rut of fixed habits and thought. His mind is even more receptive than during young student life, or if it be not, he would better not essay a specialty, as he will never succeed in it. By all means let us have "blackboard demonstrations exactly as in the case of mathematics with such works as those of Donders and Landolt as guides, together with practical work in a well-equipped ophthalmological or physiological laboratory," but let it be *after* a thorough theoretical and practical knowledge of medicine has been obtained; otherwise the satellite may be taken for the planet itself.

The legitimate results of such pernicious teaching as that of F. B. E. would be the rapid multiplication of those "rapid-firing ophthalmic colleges," optical colleges, refraction colleges, and eye, ear, nose and throat colleges, until the term oculist will be synonymous with that of optician; and neither will earn more respect than that of the term chiropodist.

S. E. Cook.

Lincoln, Neb., Oct. 10, 1898.

*Italics are my own.—S. E. C.

In a recent communication to the *Berlin Ophthalmological Society*, Professor Hirschberg stated that the large number of blind beggars seen by him in traveling through Spain some years ago, led him to investigate the subject. The only official statistics which he could find—those of the Government Census of 1860—gave the proportion of blind persons as only 11 per 10,000 of the population, a figure which appeared incredibly low in view of the numbers of blind persons seen in the streets and other public places. Further investigation showed that ever since the beginning of the present century travelers in Spain have noticed the large number of blind persons seen in that country. The official statistics have in fact been so carelessly collected that they are of no value. Diseases of the eye have for a long time been spreading to an alarming extent in the Peninsula. Hirschberg says that he has never seen such marked phthisis bulbi, or so many cases of it, as he met with usually in Spain. Even among the well-dressed people it is, according to him, quite common to see individuals who have lost an eye, and persons of the well-to-do classes who have lost both eyes are by no means rare. At the Congress of Hygiene held at Madrid in the spring Professor Hirschberg uttered a grave note of warning as to the prevalence of such preventable diseases as purulent ophthalmia neonatorum and trachoma, and urged in the interest of the Spanish people itself, as well as of its neighbors, that the medical profession of Spain should pay more general attention to diseases of the eye.

NEWS ITEMS.

Personals and items of interest should be sent to
Dr. Frank Allport, 92 State St., Chicago.

THE COLLABORATOR who superintends the publication of this part of the OPHTHALMIC RECORD begs leave to make a personal plea to every physician who reads this magazine. He desires to request such readers to take a little interest in the news column. Nearly every subscriber must be acquainted with some ophthalmological item of interest. He must have heard something or read something that interests *him.* If it interests him, it will interest others, and if every reader would send such matter each month to the name and address to be found at the head of this department, it will be highly appreciated. Please do not forget this request. Help us to make the OPHTHALMIC RECORD still more interesting!

AT LEAST one member of royalty is earning an honest living and is doing really useful work in the world, for it is said that the popularity of Duke Carl Theodore of Bavaria, who sustains an international reputation as an ophthalmologist, is so great that last year he attended over five thousand patients and performed over two hundred operations on the eye.

DR. FRANK RUMBOLD of St. Louis, has resigned as secretary of the Western Ophthalmological and Oto-laryngological Society, owing to his time being occupied with military duties. Dr. T. A. Woodruff of Chicago, has been appointed to take his place. Titles of papers to be read at the next meeting of the society in New Orleans, February 10 and 11, 1899, should be sent at once to Dr. Woodruff, at 100 State Street, Chicago, Ill., as it is necessary to have the program completed as soon as possible.

THERE ARE in Europe in the neighborhood of three hundred thousand blind persons. Of these, thirty thousand, or 10 per cent, owe their misfortune to ophthalmia neonatorum. Surely this is an appalling condition of affairs, especially when it is considered that a large percentage of such blindness might have been prevented by proper precautions.

The note of warning sounded by Crédé, Howe and others should bear fruit. M. Galezowski of Paris claims that three conditions are indispensable in order to effect a cure of these diseases. (1) Cauterization of the conjunctiva daily; (2) Continuation of the treatment from the beginning to the end of the disease; (3) Rigorous observation of the laws of antisepsis. Dr. Sidney Stephenson lays down some rules for the prevention of this malady that are so simple and practical in their application, they are worthy of reproduction and may be epitomized as follows:

(1) If a pregnant woman be known to suffer from gonorrhoea, every attempt should be made to cure the complaint before parturition. (2) In case the ailment persists, the vagina and external parts should be irrigated during labor with some antiseptic fluid, and this should be repeated from time to time if the stage of propulsion be slow. (3) After the child is born, but before the cord is cut, any secretion lodged about the lashes or lids should be carefully wiped away with wool, and moistened with perchloride lotion. (4) After the cord is severed one or two drops of a two-per-cent solution of silver nitrate should be rubbed into the baby's eyes, held open for the purpose. (5) Clean water must be used for washing the head and face, which must on no account be touched with that employed for the bathing of the body. (6) Secondary inoculations from the lochia, etc., must be avoided by the exercise of common sense and cleanliness.

THE EYESIGHT IN THE OPEN AIR.—Prof. H. Cohn asserts that examinations of the eyes indoors is no test of their actual capacity, and that all examinations of the eyes of school children, etc., should be made out-of-doors, as otherwise there can be no true standards. He states that the superior visual acuity of Indians and other savages is due to the necessity of concentrating their attention on objects on which their food and safety depend, and proves his assertions by statistics—many new and personal —which demonstrate that the out-of-door eyesight of civilized people averages as high as that of the uncivilized. He concludes that any one can make his eyesight equal to that of a savage by concentrating his attention sufficiently. He adds a plea for more out-of-door life for children, even at the expense of their studies and training in closer observation.—*Révue Gen. d'Ophtalmologie, August, 31.*

A RATHER interesting discussion has taken place lately in the London *Lancet*, between Mr. Kenneth Scott of Cairo, Egypt, and Mr. W. Adams Frost of London, on the subject of the removal of the transparent lens from the eye in high degrees of myopia.

Mr. Scott takes ultra conservative views on the subject, and believes that the operation should for the time being be absolutely dropped until such time as operations for senile cataracts can be made with absolute safety and with perfect confidence of a successful termination. He believes that the operation should be regarded entirely from the patient's point of view, and that inasmuch as the patient usually possesses a reasonable amount of vision by the aid of a properly adjusted pair of glasses he should in no case be advised to undertake an operation involving any risk whatever. He implies an exception to be made in favor of cases of malignant myopia.

Mr. Adams Frost, on the contrary, takes a more progressive though still reasonable view. He believes that if operations involving some risk must wait for their performance until all such risk is absolutely eliminated, that surgical progress would take many steps backward. He believes that it is for the surgeon to weigh the risk and advantages of the treatment, and to place them before the patient in such a way that he may be able to form a wise decision. He believes that it is not fair to compare the operation for senile cataract with the operation for high myopia, as the one involves the well-known operation for senile cataract and the other involves the operation of discission, with subsequent evacuation of the lens matter which is the recognized procedure for high myopia. He believes that while we should not rashly advocate the performance of this operation, that it should be performed, one eye at a time, in properly selected cases, where the matter is thoroughly understood by the patient and his friends, who request that the operation be performed.

We believe that professional opinion will favor the views expressed by Mr. Adams Frost.

PUKALOW treats gonorrhoeal ophthalmia, by cleansing the eyes with a two-per-cent solution of boracic acid. He then drys the lids with absorbent cotton and applies calomel, with a camel's hair brush, to the everted lids.

DR. DUDLEY S. REYNOLDS has been elected Treasurer of the Mississippi Valley Medical Association, to fill the vacancy caused by the resignation of Dr. C. A. Wheaton.

ATROPHY OF THE OPTIC NERVE IN LOCOMOTOR ATAXIA.—Silex has determined from personal observation that 15 per cent of ataxic patients present lesions of the optic nerve. These lesions are often precocious and occur during the pretaxic period. There is then observed a slow progress of the spinal disease. As regards the oft discussed relations between syphilis and tabes, Silex, out of fifty-four cases of tabetic atrophy of the optic nerve, has noted forty-four cases of syphilis—i. e., 81.5 per cent. Of eight women seven were syphilitic subjects. From this point of view it is necessary to attach a particular significance to atrophy of the base of the tongue described by Virchow and often considered as a syphilitic complication. Silex has met with this manifestation sixteen times in fifty-four cases. It is never present in non-syphilitic patients.

The manner in which optic atrophy develops is very obscure. It has no direct local relation with the sclerosis of the posterior columns. Some writers admit an ependymitis with alteration of the vascular centers of the fourth ventricle determining an affection of the optic nerve, exhibited to the microscope by diffuse total degeneration, or by islands of fibers of the nerve. Treatment gives variable results. Some patients bear mercurial inunction well, and seem to improve under the practice. Nevertheless, there is no objective amelioration, and three months later the acuity of vision again declines. In other cases the sight fails rapidly during the mercurial treatment, which has to be abandoned, and we are unable to regain lost ground.

Silex maintains that tabetic atrophy of the optic nerve is never really ameliorated by the mercurial inunctions, and that when improvement is produced there has been an error in diagnosis. On the other hand, this method of treatment has pernicious effects in many cases. The same is true of potassium iodide, which acts upon the inflammatory products of interstitial tissue.

Unfortunately, many patients absorb varied doses of iodide, to the great harm of their stomachs. Silex has endeavored to discover whether we can act upon the optic nerve by means of feeble galvanic currents of 2 to 5 milliampères applied to the cranium and neck. He experimented upon trephined dogs. A current of 2 milliampères caused weak contractions, which soon became very violent when a current of 5 milliampères was employed. The current applied to the exposed spinal cord produces convulsions. It seems, therefore, very probable that electricity might cause therapeutic effects in optic atrophy. Silex, however, has never obtained the least advantage from its use. The acuity has continued to decrease until reduced to zero. It was the same with other therapeutic measures. Strychnine, silver, thermal treatment and suspension all failed.—*La Médecine Moderne.*

Ocular Complications in Erysipelas.—By Dr. M. Ramirez (*La Médecine Moderne*, 1897).

The author thus divides the ocular complications of erysipelas:

1. Complications which Involve the Annexes of the Eye.—In the decline of erysipelas there may sometimes be observed upon the eyelids a slight or considerable oedema, with or without erysipelas vesicles, often followed by desquamation and loss of the lashes; at other times abscesses, which may leave vicious cicatrices, and these may cause ectropion; again, diffuse phlegmons, with gangrene, may occur. Blepharitis with mydriasis has been observed to follow erysipelas, as also chronic oedema, and one case of paralysis of the orbicularis.

Acute conjunctivitis sometimes occurs, and, according to certain writers, may be the point of departure of attacks of chalazions.

The lacrymal passages are attacked by slight catarrh. In certain cases the infection excites purulent dacryocystitis, with or without abscess.

When the infection is transmitted from the face to the retro-orbital cellular tissue or to the meninges and brain by way of the veins and lymphatics of the parts, phlegmon or meningo-encephalitis may occur. Meningo-encephalitis causes death, and phlegmon, in the absence of resolution, is followed by incurable lesions, such as optic atrophy, retinal hemorrhages, and thrombosis and embolism of the central artery of the retina.

2. Complications which attack the Eye-ball.—Among the lesions of the coats of the eye are a somewhat special keratitis, abscesses of the cornea sometimes terminating in ulcers with hypopyon, and paralysis of accommodation.

The deeper coats are the seat of choroiditis, often accompanied by iritis. In unfavorable cases purulent iridochoroiditis may take place. Finally, retinal hemorrhages have been reported, thrombosis and embolism of the central artery of the retina, atrophy of the optic nerve, and some cases of glaucoma.

Miss Helen Gould, daughter of the late Jay Gould, has given $5,000 to the Manhattan Eye and Ear Hospital for the endowment of a free bed.

Darier regards protargal very useful in acute catarrhal conjunctivitis, which it cures in three days, and also in purulent ophthalmia, which it cures in from eight to twenty days. He touches the inflamed surface with a solution of from twenty to fifty per cent, according to the severity of the case. As a collyrium for patients to use themselves, he prescribes a five per cent solution. Furst uses it in the new-born infant's eyes, when the mother has gonorrhœa, as a ten per cent solution, without producing irritation.

Dr. J. L. Dickey of Wheeling, W. Va., reports a family where six members developed cataract at about the age of forty. He reports another family where five members of a family were similarly affected. He must have found a cataractous zone, or perhaps, they were not all zonular cataracts.

Artificial Cornea for Leucoma.—T. V. Schröder presented a patient at the meeting of the St. Petersburg Medical Society, April 28, whom he had cured of leucoma totale corneæ by the introduction of an artificial cornea made of rock crystal and platinum, with several small hooks at the rear of the platinum setting, which bore into the leucoma tissue and hold the prothesis quite firm. Salzer of Munich found that rabbits bore a similar contrivance a year without inflammation (1895).

Schröder's patient was blind from lime corrosion in the other eye, and the leucoma had developed after smallpox in childhood. The crystal cornea showed a tendency at first to work its way forward, but a narrow band of tissue soon formed around the edges and held it in place. There was no pain, no inflammation at any time, and the tension was always normal. He counts fingers at 2.25 meters and recognized colors. The eye does not water except with very bright light; with an ordinary shield it bears the daylight without trouble. An extremely delicate gray membrane formed over the back of the crystal, soon after its introduction, but it has not increased in thickness during the thirteen months since, and the results are considered satisfactory enough to warrant the application of the method on a larger scale. A similar membrane formed rapidly and so thick in Salzer's one case that the vision was only slightly improved by the operation. He attributed this to the profuse hemorrhage during the trephining. The simple technique is described in the St. P. Med. Woch. of September 11.

Panas' Total Combined Keratectomy.—This operation avoids all the dangers and deformities of enucleation. It is especially adapted to chronic glaucomatous and painful eyes, as it ends the pain and glaucomatous condition entirely and permanently. It leaves a round, smooth stump, fully three-fourths the size of the normal eye, movable and unatrophied, over which the artificial eye-cap fits so perfectly that its artificiality is scarcely perceptible. The fears of sympathetic ophthalmia are exaggerated in these days of asepsis. He has only encountered one or two cases in the last ten thousand at the Hotel Dieu. The operation as he has performed it on two hundred patients, with or without staphyloma, consists in the first passing a Reverdin needle through the sclero-corneal limbus behind the iris and lens, carrying a silk thread, which is left for the first stitch of the suture and tied if the vitreous shows a tendency to escape. The cornea is then removed with a Graefe knife held flat, cutting it into fifths and snipping off the last fifth with the scissors. The iris is removed with the cornea, if adherent; otherwise he performs iridodyalisis. The lens is then removed with the spoon, the escape of the vitreous being carefully prevented. The stump is sutured with a couple of stitches in the sclerotic and rounded off. The surface is rinsed with a solution of mercuric oxid, dusted with iodoform and a roll of iodoform gauze applied with a dry cotton bandage outside. The threads are removed the seventh day. The danger of hemorrhage is very slight—3 cases in 200. If it occurs, the eye can be enucleated or eviscerated. The latter leaves a fairly goodly stump. He mentions in his communication to the Académie de Médecine (Bulletin, August 23d), that Pritchard was the responsible author of enucleation, but that we have now progressed beyond it. Keratectomy, effective and harmless, should take its place in many cases —another forward stride in ocular surgery.

Privatdocent Dr. E. V. Schwarz, in Leipzig, has been appointed extraordinary professor.

Dr. Emil de Berger, Paris, has been elected foreign correspondent member of the Belgian Academy of Medicine.

Dr. L. Bellarminoff has been appointed professor of ophthalmology at the Military Medical Academy of St. Petersburg.

Dr. E. von Gross has been appointed adjunct professor to the chair of ophthalmology at the University of Budapest.

The death is announced of Professor Steinbrugge of Ziesen.

THE

OPHTHALMIC RECORD

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ORIGINAL ARTICLES.

THE DISTANCE BETWEEN SURGEON AND PATIENT FOR ACCURATE SKIASCOPY.

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ILLUSTRATED.

To see a thing you must get within seeing distance of it. A certain area cannot be perceived beyond a certain distance. The half-metre test-types are very useful at the distance of a half metre or less, but they are of very little use at one metre, and quite worthless at two, four or six metres. In skiascopy there are movements of light and shadow in the pupil that can be seen at one-half metre, which are not to be seen at one metre or any greater distance ; and in many eyes it is these movements, and these alone, that truly indicate the "refraction of the eye."

When we speak of the "refraction" of an eye we mean the refraction of that part of the dioptric surfaces through which the best vision is obtained. The trial lenses in the subjective test deal usually with this refraction alone, completely ignoring the refraction of all other parts of the pupil. It is true Donders said something about "normal irregular astigmatism" present in all eyes ; but in practice the ophthalmoscope, the test-lenses, the radiating lines, the stenopaic slit, the various optometers never remind us of this "normal irregular astigmatism," this departure from the "refraction of the eye" which occurs in the periphery of every dilated pupil. Hence in works on ophthalmology, and in papers about errors of refraction and their measurement and correction, it is usually quite forgotten.

But if one wishes to practice skiascopy with skill and exactness he must not forget this refractive condition for an instant, during the application of the test to any eye. Until this is thoroughly understood the possible accuracy and the reliability of skiascopy cannot be attained or even appreciated.

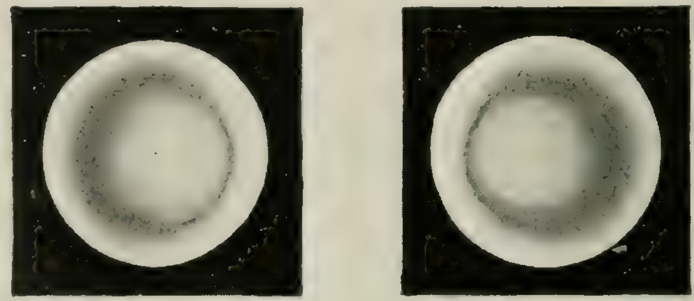
The essential fact is, that in every dilated pupil there is a restricted area, in which the refraction is comparatively regular, and the same in all portions, whether it be hyperopic, myopic or astigmatic. It is the correcting lens for this area that the patient usually selects by subjective tests. It is for the correction of this area that we prescribe correcting lenses. It is the light entering through this area, and usually this light alone, that can be perfectly focussed on the retina, either with correcting lenses or without them. This area I have called the *visual zone*[1].

This area never occupies the whole of the dilated pupil. Around it there lies another area in which the refraction is not regular, is not the same in different portions ; an area the refraction of which is commonly entirely ignored by the patient in his selection of lenses by subjective tests, and equally ignored by the surgeon in prescribing lenses ; and usually no lens, or combination of lenses, can accurately focus on the retina the light entering through this area, or cause it to give distinct images. This latter area I have called the *extra-visual zone.*

In most eyes the visual zone contains less than half the area of the dilated pupil; the extra-visual zone contains more than half. In some the visual zone contains only one-tenth the area of the pupil, the extra-visual zone nine-tenths.* Usually the visual zone occupies the center of the dilated pupil ; and the whole of the pupil when it is contracted by strong light out of doors, or by associated impulses, with the convergence and accommodation usually necessary for near work. But in the majority of eyes, without the use of any mydriatic, the pupil dilates sufficiently, in a room darkened for skiascopy, to include a considerable portion of the extra-visual zone ; and in some eyes a portion of this zone is exposed even under the ordinary conditions of normal use of the eyes in a good light.

In skiascopy, therefore, one has to consider the appearances presented in a visual zone of the pupil having a certain state of refraction ; and the appearances presented in an extra-visual zone having a different state, or

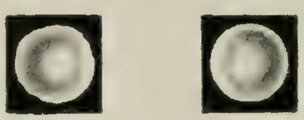
*It is to be remembered that the area is proportioned to the square of the diameter. Thus in a pupil 8 mm. in diameter, if the visual zone were 5 mm. in diameter, their areas would be as 64 to 25. If the visual zone were but 2.5 mm. in diameter the proportion would be as 64 to 6.25.



A

Fig 1

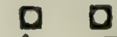
B



A

Fig 2

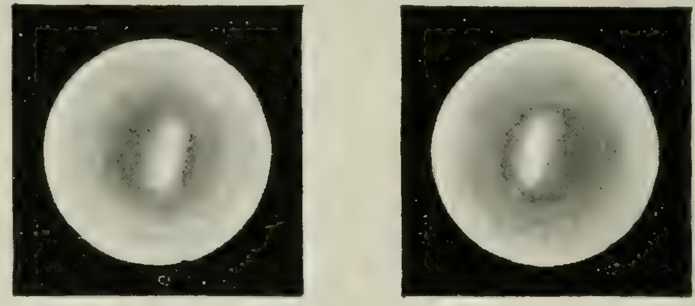
B



A

B

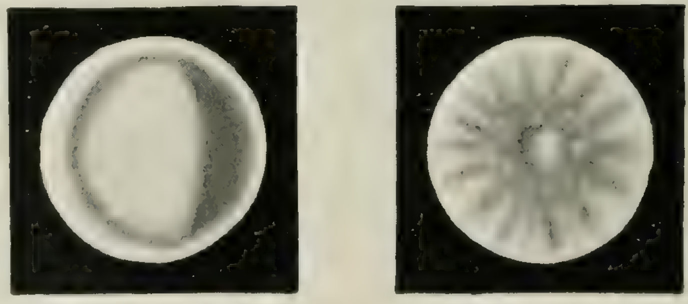
Fig 3



A

B

Fig. 4



A

E

Fig. 5

different states of refraction. Obviously, exact and reliable measurements of the refraction by skiascopy are only possible when the surgeon is near enough to the examined eye to discriminäte between these zones; and to recognize with certainty the movements of light and shadow within the visual zone.

While no one may be disposed to question the theoretic correctness of this view, the adaptation of distance to the requirements of the case has been so generally ignored that it is certain that few understand its practical importance. To illustrate and enforce that importance a few common instances may be considered.

The commonest optical condition of the extra-visual zone is that of positive aberration. (See chapter V of the writer's monograph[2], and original description[3]). The visual zone is not usually much over 5 mm. in diameter; and a case of aberration having such a visual zone is represented in Fig. 1, which gives the appearances presented at a point about 0.5 dioptre closer to the patient than the point of reversal, with mirror facing in A rather to the surgeon's right, in B to the left. The pupil is here represented as magnified three diameters. In Fig. 2 the same appearances are represented, but only of life size. In Fig 3 we have the same thing reduced to one-fourth the dimensions of Fig. 2.

If this page be placed one metre from the eye Fig. 2 will represent the appearances presented in skiascopy as practiced at a distance of one metre from the patient. In contrast with these Fig 1 shows the relative size and appearance of the pupils from a distance of one-third of a metre; while Fig. 3 gives about what is visible when the surgeon places himself four metres from the patient. In such a case it is quite possible to recognize the movements of light and shadow in the visual zone at one metre, although it would be somewhat easier at a shorter distance. But at four metres there must be great uncertainty about them. And the great trouble at four meters is, not that no movement of light and shadow can be perceived—if that were the case no one would think of working at such a distance; but that it is utterly impossible to tell whether the movements perceived are in the visual or the extra-visual zone. Indeed in most eyes it is the movement in the extra-visual zone that can be perceived at the greater distance; and thus applied skiascopy becomes only an approximate test, accurate only to the extent that the refraction of the extra-visual corresponds to that of the visual zone.

In Fig. 4 are presented the characteristic band-like appearances of astigmatism in an eye getting 4/3 vision with +1.50 cyl. axis 80°; this being the correction for its visual zone, which included an area between 3 and 4 mm. in diameter at the center of the pupil. They are shown with the mirror facing in A to the surgeon's right, in B to his left. At one metre it would have been easy to overlook the characteristic form and direction of the little area of light that flitted back and forth in a small space at the center of the pupil. And had the astigmatism of this visual zone been lower in amount, 0.50 or 0.75 D., as it is in the majority of cases that require correction, it would have been quite impossible to detect any sign of it at one metre distance, although it could be certainly recognized at one-half metre. In a considerable portion of cases the characteristic appearances of astigmatism are strictly confined within a small visual zone.

Again, as one approaches the point of reversal the area of uniform movement of light and shadow, the area of the apparent visual zone diminishes ; and just at the point of reversal it breaks up into smaller areas differing slightly from each other in refraction. Often the true visual zone is only one of these smaller areas, the existence of which will remain quite unsuspected if one works always at one metre. A case of this kind is illustrated in Fig. 5, in which A represents the appearance of the pupil from about 1D, within the point of reversal, the mirror facing rather to the surgeon's left ; and E represents the appearance at the point of reversal for the vertical meridian, showing the true visual zone with a faint area of light indicating the presence of 0.50D. of astigmatism with the rule, confined to such a small area that it could not possibly have been detected by skiascopy at one metre. At the same time the segmental inequalities in the refraction of the lens become evident in the periphery of the pupil.

To appreciate the importance of testing such an eye by skiascopy at one-half metre, it must be noted that astigmatism confined to such a small area is very likely to be overlooked with the test-lenses used upon test-type at twenty feet, in the ordinary light of a surgeon's office, even without a mydriatic. But that small area will constitute the whole pupil, when the eye is exposed to strong daylight, or the patient is taxing his accommodation for near work ; and the correction of its astigmatism will be practically as important as the correction of the same degree of astigmatism affecting the whole dilated pupil.

In view of the practical reasons for skiascopy at shorter distances it seems strange that almost every account of skiascopy in our text-books mentions one metre or more as a proper distance between surgeon, some even advise four metres or more for the plane mirror ; and the writer has been alone in urging the use of the test from a distance of "one-half or one-third of a metre, or even less."[4] It is, however, certain that for many eyes accurate measurements of the refraction cannot be made at greater distances. This point is of vital importance to skiascopy. Failure to recognize fundamental conditions of general accuracy for the test has raised a doubt as to its accuracy and reliability even in the minds of some of its advocates.

It is not claimed that all examinations must be made at so short a distance. Only that some must be made at this distance, while others can be made here or at greater distances. In practice the writer finds himself now commonly applying the test at distances of eighteen to thirty inches, corresponding to myopia (usually artificial) of from 2.25 to 1.25D. This practice was adopted, not in obedience to theoretical considerations, but rather in spite of them; since it rendered necessary their amendment by recognition of the refractive conditions underlying the separation of the pupil into visual and extra-visual zones. As a matter of fact it is found that attention to certain details, as the form size[5] and position of the source of light,[6] and the size of the sight-hole in the mirror[7] make it possible to attain the greatest practical accuracy (0.25D. to 0.125D.) even at these short distances mentioned.

With skiascopy one has in the pupil a map of various refractive conditions situated in different areas. The nearer the pupil the larger the scale of this map, and the easier to note its smaller details. Then it is not a map in black and white, but of brighter red upon duller red ; and as the point of reversal is approached the contrasts diminish, the areas shade imperceptibly into one another, so the need to have it on a larger scale increases.

Matters closely related to the subject of this paper have been discussed elsewhere as indicated in the following:

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[2]Skiascopy and its Practical Application to the Study of Refraction. (Chap. V.)

[3]Transactions American Ophthalmological Society, 1888, p. 141.

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[5]Retinal Illumination for the Shadow-Test." (Ophthalmic Review, 1890, p. 44).

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THE UTILITY OF THE OPHTHALMOMETER,

BY DR. GEORGE J. BULL,

OF PARIS, FRANCE.

In discussing the utility of the ophthalmometer it is worth while to remember the way in which the instrument came into existence. Helmholtz had already succeeded, many years ago, in devising an instrument with which Knapp and Donders were able to measure corneal curvature in the laboratory; but the method was altogether too difficult and complex to be applicable to the uses of the consulting room. It occurred therefore to Dr. Javal about the year 1879 to endeavor to obtain an adaptation of the instrument of Helmholtz by means of which astigmic error could be conveniently determined for the purpose of prescribing corrective glasses. By the aid of the mechanical and mathematical skill of Dr. Schiötz of Christiana, Dr. Javal was able to solve the problem, and the ophthalmometer which bears their joint names was the result.

Javal applied this in his practice at first with the assumption that he could prescribe off-hand the glasses indicated by the reading. At this point I joined him. We soon found that glasses so prescribed were not the proper correction of the real astigmia, and I have ever since been engaged in the effort to work out the problem so presented, and to establish the true principles of the exact correction of refractive error. The result is to convince me that although the ophthalmometer cannot, in the least, be used as was at first intended, it is nevertheless a most valuable guide and check in the search for the correcting glass.

The conditions of the problem of the correction of refractive error may be broadly stated as follows: Astigmia of the whole eye — total astigmia, as it is called — is the resultant of the special astigmia of four refracting surfaces; or, in other words, is the resultant of the corneal astigmia which is measured by the ophthalmometer and intraocular astigmia, under which term I include the error due to the posterior surface of the cornea, and the anterior and posterior surfaces of the crystalline lens.

To determine the amount of intraocular astigmia, we have recourse to such instruments as Tscherning's ophthalmophacometer. Tscherning has examined a certain number of eyes and has found in all of them that the crystalline and the posterior surface of the cornea produce together an inverse astigmia.

My own experience leads me to believe that this is the general rule; for the comparison of the amount of the corneal astigmia with that of the total astigmia in a large number of cases shows that the difference may be roughly expressed as being equal to an inverse astigmia of about 0.75 D. I find also, that the meridian of greatest refraction of the whole eye does not always coincide with the meridian of greatest corneal curvature; and that if the corneal astigmia be of low degree, the meridian of greatest refraction of the eye will incline more toward the horizontal than does the most curved meridian of the cornea. I find also that when the corneal astigmia is high the meridian of greatest refraction of the eye commonly coincides with the meridian of greatest corneal curvature; all of which facts are indications of the correctness of the hypothesis just stated.

Although one element out of the four can be measured with quickness and accuracy by the ophthalmometer of Javal and Schiötz, and although there are laboratory methods by which the other three factors can theoretically be determined by objective measurement, there is no method available in ordinary practice by which an observer can determine the total astigmia merely by taking the readings of one or more instruments.

As this conviction has impressed itself upon practicing oculists it is perhaps natural that many of them have been inclined to put the ophthalmometer aside, as an instrument which had failed of its purpose. Some have even supposed that the rival ophthalmometer of Kagenaar or that of Hardy, might be looked to for better results. Both ideas are entirely erroneous. The ophthalmometer of Kagenaar (and that of Hardy), although an instrument of considerable merit, has no real advantage as compared with the instrument of Javal, and it has the disadvantage that the amount of doubling produced by its biprism varies with the distance of the patient.

The supposition that the ophthalmometer itself is to be regarded as a failure because its readings cannot, for the reasons above stated, express the total astigmia is very short sighted. Apart altogether from those cases in which an ophthalmometer is absolutely indispensable for the purpose of studying the changes of corneal curvature which occur after wounds of the eye, and during the progress of keratoconus, pterygium, etc., and its obvious value in the diagnosis of irregular astigmia, it is established that the practical value of the instrument in ordinary cases of regular astigmia is even greater than many of its admirers realize.

It is a great advantage to know beforehand the amount of astigmia that we may expect to find. By the use of certain rules presently to be stated, we can safely infer in many cases from the ophthalmometric measurement that the total astigmia does not exceed 0.25 or 0.50 D. Such an inference is often of value, and saves us from a wearisome and fruitless search with cylindrical glasses. When, on the other hand, the ophthalmometer shows that we have to deal with a high degree of astigmia, we properly dispense with trials with the beaker cylinders, and in this way gain time, spare the patient fatigue, and greatly simplify the problem which his answers help us to solve. Much might be said on the value of the instrument as a time-saver; but I prefer to call attention to an advantage which has not, to my knowledge, been referred to by other writers.

This advantage is that the ophthalmometer enables us to proceed in the different parts of the subjective examination with logical precision and certainty, not so much by indicating the amount of astigmia as by pointing out the position of the meridian of least refraction.

The method I recommend* for the subjective examination of astigmia consists of two steps: first, by means of spherical glasses I shift the patient's range of accommodation, so as to bring the *remotum* of the meridian of *least* refraction to the test cards at 5 metres; and, secondly, by concave cylindrical lenses I carry back the *remotum* of the meridian of *greatest* refraction till it also rests on the test-cards. The first of these steps fixes one end of the object to be measured, and prevents its moving in a way to mislead me; for if at any subsequent moment during my trials the eye accommodates, the lines which remained distinct on the clock-dial will appear less distinct, and all the other lines will be blurred in proportion; and, in fact, as if aware of this the eye makes no efforts of accommodation. The lines remain unequal in distinctness until we add the cylindrical glass which corrects the astigmia.

In myopic astigmia it is the common practice of observers to proceed on a plan closely resembling the one I have just outlined. Instead, however, of following such a plan in cases combined with hypermetropia, they take no special pains to distinguish between the two principal meridians, and not knowing with which they have to do, fail to prevent changes in accommodation which alter the relative value of the radiating lines of the clock-dial. The practical result of this, and of trying new convex and new concave cylinders, is simply to introduce artificial difficulties into the solution of the problem. By my method, however, the process is exactly the same for hypermetropic and mixed astigmia as for myopic astigmia, and mydriatics are not required.

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*Bulletin de la Soc. Francaise d'Ophtalmologie, 1895, p. 399: Ophthalmic Review, 1895, p, 275; Archives d'Ophtalmologie, 1896, p. 219.

This method can, like all other subjective methods, be carried out without the aid of the ophthalmometer; but that instrument can often be made to render a special service in this connection. I shall presently give a series of empirical rules, by which it will be seen that there are inferences to be drawn from the ophthalmometric reading before the patient has been examined in any other way; but other and more important inferences can be made when the ophthalmometric reading is considered in connection with the answers given by the patient during the subjective examination.

The instrument, as I have said, informs us of the position of the meridian of least refraction of the eye, and thereby often enables us to interpret the answers of the patient in a highly practical way. If, for example, the instrument shows a direct corneal astigmia of 4 D. (0 ± 4.) we may infer with certainty that the horizontal meridian of the eye in this case is the meridian of least refraction. If, now, the eye, looking without a glass at the clock-dial, six metres distant, perceives that the *horizontal* lines (and not the vertical) seem the most distinct, we *recognize at once that the eye is strongly hypermetropic*, and by rapid steps, passing over the weaker lenses as useless, we find the strongest convex lens with which the vertical line of the clock can be seen distinctly, and then add the weakest concave cylinder that will render the transverse lines equally distinct.

It may be said without exaggeration that the use of the ophthalmometer in connection with any special method of subjective examination makes hyperopic, and mixed astigmia often easier of correction than simple myopic astigmia.

As a result of my examination of the problems presented by this instrument, during the twelve years since I first joined Dr. Javal in his efforts to apply it in practical work, I am able to say that there are a few simple rules by the application of which the measurements of the ophthalmometer may be made to furnish a most useful guide. Speaking broadly, it may be said that the total astigmia is approximately equal to the amount indicated by the ophthalmometer, expressed as myopic astigmia, combined with an inverse myopic astigmia of 0.75 D. It may be said that :—

(1) When the corneal astigmia is direct, and above 1 D., we may expect the total astigmia to be also direct, but of lesser amount.

(2) When the corneal astigmia is direct, and about 0.75 D., we may expect to find an almost total absence of astigmia by subjective examination.

(3) When the corneal astigmia is direct and 0.25 D., subjective examination will probably reveal an inverse astigmia of about 0.50 D.

(4) When there is no corneal astigmia we may expect to find by subjective examination an inverse astigmia of about 0.75 D.

(5) When the corneal astigmia is inverse, we shall generally find by subjective examination a higher amount of inverse astigmia.

(6) When the corneal astigmia is oblique, and direct rather than inverse, a lower degree of astigmia will be discovered by subjective examination. The reverse of this is true when the obliquity tends to bring the case into the class of inverse astigmia.

(7) When the corneal astigmia is oblique and of low degree, the meridian of greatest refraction of the whole eye commonly inclines more toward the horizontal than does the meridian of greatest corneal curvature.

(8) When the corneal astigmia is of high degree the meridian of greatest corneal curvature coincides with the meridian of greatest refraction of the eye.

The above deductions are, of course given only as approximations to the truth. The ophthalmometer should never be considered as a substitute for the subjective method of examination. It should be looked upon as a guide and as a check, enabling us to conduct the subjective examination on logical principles.

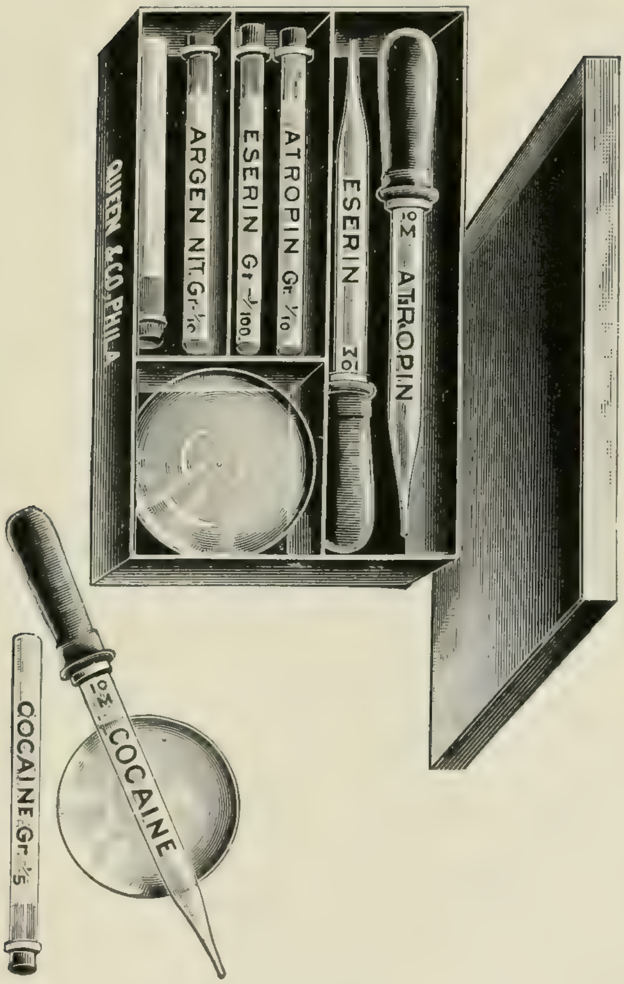
A CASE FOR THE EXTEMPORANEOUS FORMATION OF THE SOLUTIONS USED IN EYE SURGERY.

WILLIAM E. BAXTER, M.D.

BOSTON.

Illustrated.

There is no question as to the desirability of having the solutions of drugs used in eye surgery aseptic, though there is some difference in the methods used by various surgeons in reaching this end. Some use in their interocular operations the solutions in daily use in their practice, sometimes, perhaps, made up in a saturated solution of boric acid. Others use special solutions reserved for interocular operating. Others carry special


QUEEN & CO. PHILA
ARGEN NIT. Gr. 1/10
ESERIN Gr 1/100
ATROPIN Gr 1/10
ESERIN
30
1M ATROPIN
1M COCAINE
COCAINE Gr 1/5

flasks in which the solutions can be sterilized by boiling before each operation, and this might be satisfactory were it not for the fact that some of the drugs in ordinary use are injured by boiling. Others use fresh solutions made for each operation, which is perhaps the best if the druggist can be relied on to use sterilized water and receptacles. The writer has had a case made up, by means of which various solutions can be extemporaneously prepared, and for perfect asepsis and convenience leaves little to be desired. This outfit consists of a nickel box 4 by $2\frac{1}{2}$ by $\frac{5}{8}$ inches, partitioned as seen in the illustration, containing three dropper pipettos of exactly ten minims capacity, and having the words atropin, cocain and eserin engraved upon them; three watch glasses of a size to hold about twenty minims; and tubes containing tablets or discoids, in a soluble state, of the pure drugs of cocain hydrochlorate gr. $\frac{1}{5}$, atropin sulphate gr. $\frac{1}{10}$, and eserin sulphate gr. $\frac{1}{100}$. These discoids are of the exact weight to make with ten minims of water, solutions of cocain 2. per cent atropin 1. per cent and eserin .1 per cent; by increasing either the number of discoids, or the amount of water, solutions of different strengths can be made. In using this case all that is required to form an aseptic solution is to place the droppers and the watch glasses in boiling water, to render them sterile, place ten minims of the boiled water in one of the glasses with the dropper, drop in a discoid, and one has ready for use a small quantity of a fresh solution. This case has been made for me by Queen & Co., Philadelphia, from whom the case and discoids may be obtained. The discoids are made by Schieffelin & Co., New York.

553 Boylston Street.

THE SURGICAL TREATMENT OF AMETROPIA.

BY ROBERT SATTLER, M.D.

CINCINNATI. O,

Surgery, undertaken with a definite purpose for the betterment of sight and the permanent reduction of an ametropic state dependent upon abnormal congenital or acquired axial dimensions, or a malformation of the dioptric media, is a modern achievement.

Formerly surgical intervention was confined to certain congenital deformities* and to the excessive degrees of ametropia which accompanied them.

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*The time required, as well as the risks which had to be incurred in these uncommon cases, were greatly out of proportion compared with the slight benefit which even the most successful surgical treatment could secure, and for these reasons it found little or no favor. It was more encouraging in those cases of acquired ametropia dependent upon ectasia of the cornea and other attendant morbid changes, the result of local and constitutional causes, with their high myopic and astigmatic refraction.

It was only occasionally practiced, and almost without exception with indifferent success in congenital staphyloma-pellucida or keratoconus and dislocations of the lenses. In cases of congenital partial opacity of the lenses, cataracta zonularis, pyramidalis, etc., it was practiced with more satisfactory results.

Before other questions, which bear prominently upon the subject, are taken up, it is necessary, at the outset, to re-affirm a well known statement that the modern surgical methods for the relief of ametropia in general are concerned with and can only accomplish a reduction in the power of the dioptric apparatus.

For this reason it is evident that the application of surgery is limited, and that it can only be resorted to for the amelioration of the myopic expression of ametropia. But even with this class of cases, it is justifiable only, in the higher or excessive degrees of axial and dioptric myopia, and of incorrigible corneal or lenticular astigmatism. To the latter must be added the more infrequent congenital malformations, with their excessive refraction and hopelessly reduced and hampered sight,—lenticonus,—altered index of refraction of all, or of one or several sectors of the lens with preservation of transparency,—of thinning and ectasia of the extreme periphery of the cornea or of its central region.

In such cases surgical interference is justifiable, only, if repeated and painstaking tests have disclosed that no combination of lenses affords useful aid. If the patient, in consequence of his blindness, is rendered helpless, it may become an imperative, necessary, venture.

The special purpose of surgery, in cases of high myopic deformity, in which it is both a justifiable and necessary measure, is wholly concerned in bringing about a reduction of the existing excessive refraction.

It is to Fukula that the distinction belongs of having first suggested the removal of the lens with the definite aim of reducing by 10. to 12. D. a higher or excessive degree of myopia, or, in exceptional instances, in which the myopia happened to correspond to the refractive power of the lens, 9. to 11. D., to completely or exactly neutralize the existing ametropia.

If surgical intervention was successfully accomplished, the necessity of wearing strong concave glasses no longer existed, in certain cases; in others much weaker lenses could be used after the operation therefore doing away with the objections which the constant use of strong concave glasses entails.

If the special indications for surgical intervention in the relief of uncommon ametropic states of the eye are considered, it will be found to accomplish a useful purpose in different expressions of excessive myopic refraction.

The foremost indication is to reduce, or neutralize, certain high or excessive degrees of congenital (axial) myopia (higher than 11 D.) in which marked or active structural disease of the internal structures can be excluded, in youthful and otherwise healthy subjects.

If, in addition, it can be established that the congenital deformity, especially at the posterior pole, is not too marked, and if it can, furthermore, be assumed with reasonable certainty that the amblyopia (or the impossibility to obtain, at best, more than 0.1 or 0.2 vision, even with the strongest lenses) is not due to an anamoly of the perceptive structures, but to excessive refraction or incorrigible astigmatism of the lens, a more favorable indication, even, for surgical treatment is at hand.

In such cases it is not alone justifiable, but it holds out a prospect for the betterment of vision, which lenses can never afford without it.

The most brilliant achievements of surgery are observed in those, unfortunately, very rare cases in which the removal of the lens neutralizes exactly the excessive degree of ametropia present and restores useful vision without the aid of corrective lenses. It is also indicated, during adolescence, in the higher degrees of acquired myopia, in which an arrest of progression appears evident. The lenses which are necessary to secure whatever vision may be present, are thick, heavy and cumbersome. To rid the patient of this annoyance, and to secure better vision, for even in these cases (dioptric myopia) altered refraction on the part of the lens cannot be excluded, the operative treatment is a measure of rational expediency. It is contra-indicated in all excessive degrees of congenital or acquired myopia, in which a tendency to inexorable progression must be admitted, together with unmistakable evidences of structural disease of the uveal tunic, vitreous humor and retina. It is inexpedient to practice this method in older subjects with evidences of synchisis of the vitreous humor with imminent detachment of the retina.

Removal of the lens may be effected by one of two methods, which the choice of the surgeon must determine. The operation, in young subjects, should invariably be preceded by a carefully guarded traumatism, which brings about cataract. This is subsequently removed by discission or extraction, as the judgment of the surgeon may decide. In adults who have passed their thirtieth year, extraction is the method, and this can be done either without inflicting a previous traumatism, which renders the lens opaque, or the lens is removed in its normal or transparent state.

Risks attend both procedures, but with the latter they are greater than with the former. If a cataract is artificially produced, increase of tension and other complications, due to swelling of the lens, can be more effectually combatted. If the lens is removed in its transparent or normal condition, capsular adhesions may prove troublesome, and cyclitis, glaucoma and other complications may be excited.

It is also indicated in excessive dioptric myopia (congenital malformation with preservation of the transparency of the lens). For these uncommon expressions of congenital ametropia, the application of surgery will, I am confident, secure in this country also the same brilliant triumphs which have been achieved abroad. I have long been of the opinion that we often assign the impossibility to obtain a better acuity of vision in these unfortunate cases, to fictitious amblyopia of perception. It is far more probable, in certain cases at least, that, together with a moderate axial myopia, the real cause for feeble or diminished sight which cannot be improved by optical aid, is dependent upon a congenital alteration of the index of refraction of the lens, with the additional, and still more uncommon variation, in some instances, of greater or less refractive power in its different parts or sectors. Necessarily, this results in distorted refraction and its inevitable consequences. Such cases bear an inseparable resemblance to, and are classed with, the high and incorrigible myopic deformities. Ineffectual attempts to secure better aid from glasses finally convince both physician and patient of the uselessness of the effort.

Surgery is furthermore indicated in these cases of myopic refraction, due to conical cornea and allied lesions of this important part of the dioptric apparatus, in which most painstaking search proves the impossibility of securing better vision by the aid of even the strongest combination of lenses.

In a recent communication* on the surgical treatment of ametropic states, dependent upon conical cornea, the results of a limited personal experience are summarized, and, as the indications are there stated, no further reference is here necessary. Personally convinced of the advantage of surgical intervention in certain cases of high ametropic defects, I can only add the hope that in this country we may, in time, aid the zealous workers abroad in this department of ophthalmic surgery. Our opportunities are more limited. The cases so common abroad are less so with us. For this reason it will require time before a final or decisive concensus of opinion can be given, based on larger experience and investigation.

*Read before the meeting of the American Ophthalmological Society, July, 1898.

ANISOMETROPIA.

BY S. D. RISLEY, M.D.,

PHILADELPHIA, PA.

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There is probably no class of congenital abnormality of vision which proves more annoying to the patient or more puzzling to the ophthalmic surgeon than anisometropia. Starting with the proposition that for ideally perfect vision we must have a pair of emmetropic eyes with a physiological range of accommodation and convergence, it is obvious that this ideal condition must suffer impairment from any considerable variation in either of the conditions. Observation and experiment have shown, however, that within certain limits, which probably vary in different individuals, an acquired adaptation to the faulty conditions between accommodation and convergence may be secured by experience, and relatively comfortable binocular vision enjoyed. When, however, a great difference exists in the degree of the anomaly of refraction present in each eye the difficulty of adaptation is much greater, if not impossible. The probability of greater difficulty is rendered manifest by a few simple considerations. For example: Any wide difference in refraction suggests at once a corresponding difference in the form of the eye balls, a very high hypermetropia being due to a shallow ball, or it may be to one abnormally small in all its diameters as compared to its fellow, which may be approximately emmetropic, or even myopic and abnormally large in all its diameters. These conditions introduce a number of disturbing factors. In the first place the abnormally small ball will be moved in all directions with relatively greater ease than its fellow, whether emmetropic or myopic. Then too, the images projected upon the macula by its dioptric system when carefully and accurately focused upon the retina will be smaller than those received by the fellow eye. It is of more clinical importance, however, that the same image cannot be focused simultaneously on the macula of both eyes. In the hypermetropic eye, e. g., a considerable tension of the ciliary muscle, it may be that the total range of accommodation will be required even for distant objects to secure an accurately focused image on the retina; while the fellow eye, whether emmetropic or myopic would receive only a blurred image at the macula. Indeed, the blurring of the image would be increased in either case by the effort of the hypermetropic eye to see distinctly, for the reason that the accommodation impulse cannot be exercised by the eyes separately. Therefore, with an accurately focused image in the hypermetropic eye, the focus of the dioptric system of its fellow whether emmetropic or myopic, must be in front of the retina. On the other hand, if a clear image is enjoyed by the emmetropic or myopic eye, the focal point must lie far behind the retina in the hypermetropic eye. Satisfactory binocular vision is therefore impossible.

The clinical management of this condition is the problem which daily meets the surgeon for solution. Fortunately, in a considerable number of these patients their experience solves the problem by abandoning any attempt at binocular vision, in which case, the more defective eye is allowed to wander out, the divergence permitting the obscured or imperfectly focused image to fall upon a less sensitive portion of the retina than the macula, where its recognition by the visual centers can be more readily neglected. In a much larger group of patients, however, a converging strabismus is acquired, the defective or less useful eye being abandoned to strong convergence and no effort made to secure binocular vision. Unfortunately for the comfort of many individuals afflicted with anisometropia they do not for some reason secure freedom from asthenopia in this manner and therefore seek relief at the hands of the surgeon, not from a strabismus, but from pain and imperfect vision.

In cases of myopia on one side, and hypermetropia on the other, it is quite common to find no effort at binocular vision, but nevertheless, for the most part, parallel visual axes. In such cases the hypermetropic eye is used for distant vision, and the myopic eye for near work; the former possibly slightly diverging during the act of near sight. The writer recalls two instances, both clergymen, who had enjoyed comfortable use of their eyes under these conditions until advancing presbyopia disturbed the possibility of clear vision either for distance or near. At fifty years of age it was no longer possible to correct by any possible effort of the accommodation the hypermetropia for distance, while the myopia in the other eye was not sufficient to correct the presbyopia. There was present in both cases low grades of astigmatism in each eye. It was needful, therefore, to seek relief from their steadily increasing asthenopia and imperfect vision.

Before turning to the methods to be adopted for the relief of anisometropia the etiology and nature of these conditions need some consideration. As regards antemetropia,* it may, from the standpoint of etiology be considered with anisometropia, i. e., emmetropia, or a relatively low grade of hypermetropia or myopia on one side and high grades on the other. In the writer's experience, with rare exceptions, in antemetropia the myopia has been acquired, and in cases where the struggle for binocular vision still persisted was still progressive and associated with the advancing characteristic pathological conditions of progressive nearsight. In every case coming under the writer's observation one or both eyes have been also astigmatic, the astigmatism being present in higher degree usually, on one side than on the other.

Another noteworthy fact is that the principal meridians of the astigmatic cornea are asymetrical. That is to say, if at 90° and 180° in the better eye, they will be found inclined in the more defective one. The fact that these defects in the form of the ball are congenital, led me very early in their study to seek for their cause. Very many photographs taken at different ages between infancy and adult life of individuals belonging to this group have been secured, and careful observation made of the relative size and shape of the two sides of the face. Hatter's forms have been studied and the peculiarities in the shape of the skull noted. It very soon became obvious that not only were the ocular defects congenital, but that they were associated with abnormalities of form in the skull which gave rise to variations in the size and form of the orbits. The eye balls, developed within these abnormal bony environments, were subject to corresponding degrees of distortion resulting in varying grades of hypermetropia and astigmatism. In many cases of high grades of refraction defect in one eye, usually with high astigmatism and asymetrical meridians, the face on the corresponding side will be found smaller than on the other, the zygomatic arch less prominent, and the lines of the skull quite different from those on the opposite side, as shown by the hatter's forms or by cursory observation. If a horizontal line be drawn through the pupil of one eye, it will frequently be found to lie above or below the pupil of its fellow if the head is held erect. There is often observed also a marked lateral displacement, the pupil of one eye being much nearer the median line of the face, as represented by the bridge of the nose. It is in these cases of congenital abnormality that are found the most annoying examples of absolute insufficiency of one or more of the extra-ocular muscles which adds greatly to the complexity of the problem of relief. It is to be expected that, when an eye ball is deformed through development in an abnormally shaped orbit, we should find also derangement of the binocular balance through faults in the length and direction, the origin and attachment to the globe, of the complex motor system of the eyes. Clinical experience demonstrates the truth of this *a priori* reasoning in many of these patients. These considerations should be sufficient to deter the thoughtful surgeon from all dogmatism in the study and treatment of these unfortunate patients. They certainly bring to him for solution a very complex problem, one that he can solve, if at all, only by the most careful and patient study and painstaking work. The writer has not infrequently failed to secure comfortable binocular vision, but, on the other hand, has often been gratified by success.

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* Noyes, 5th International Congress, 1877.

In those patients who have acquired a strabismus and their present discomfort is due to an uncorrected error in the fixing eye, it has been his habit to correct the refraction error in the better eye and neglect the other. The endeavor to bring it into use by tenotomy, or by advancement operation is usually unsuccessful, and is liable to secure only additional pain and discomfort. With strong convergence, or a wide divergence, the image is readily neglected, but when, as a result of operation, it comes to lie near the macula a disturbing diplopia is produced, to overcome which a constant effort is required which causes distressing asthenopia. Moreover, if by operation, we are successful in securing accurate parallelism of the visual axes, the difference in the size or the improperly focused macular image is more likely to cause disturbance than to give satisfactory vision. It is usually wise therefore to avoid in such cases any effort to secure binocular vision. There are, however, exceptions to this rule. A shoemaker, aged thirty-five, came to the Wills Eye Hospital for relief from severe asthenopia. The left cornea was partially covered by the internal canthus, the strabismus having existed since childhood. The eye was amblyopic and highly hypermetropic. The fixing eye had a moderate degree of hypermetropic astigmatism. He received a full correcting glass for each eye after prolonged use of atropia but without relief to his severe headaches. A free tenotomy was then made on the converging eye, with result of completely relieving his asthenopia, although binocular vision was not restored. Another instance was that of a sister of charity, a teacher, with a very high grade of compound hypermetropic astigmatism in the right eye and a low grade of simple hypermetropic astigmatism in the other. The right eye was turned upward strongly, and the cornea partially covered by the eye lid. She stated that this eye had never been used. She suffered from constant headache with frequent explosions into violent attacks of so called "sick headache" which forced her to bed in a darkened room. The left eye was corrected, with the result of affording partial relief. The pain was so severe, however, after her day in the school room that she sought further aid. The superior rectus was then divided and the refraction error carefully and totally corrected. Binocular vision was secured, and she has had, now for many years, practically complete relief from her asthenopia.

In patients who maintain parallel visual axes, notwithstanding a wide difference in the refraction of the two eyes, even in cases of antemetropia, actual experience often puts to flight all our theories of refraction and their comfort is secured by a careful total correction of the existing error in each eye. Such glasses are not infrequently worn constantly with perfect comfort. The case books of the writer contain many examples corroborating this statement. For near work, even before the age of commencing presbyopia, it is frequently necessary in these cases to correct the eyes for a common far point of 2.D., or 2.50 D. In the cases of the clergymen mentioned above, they each received full correcting glasses for distance and a calculated glass for near work, e. g. A. L. aged fifty years, O. D.+1.50 D.○+.75 D. cy axis 90°, V. 6/vi:—O. S.—1.○—1. cy axis 180° V. 6/vi. These were prescribed for constant wear. He received the following formula for near work. O. D.+3.50○+ .75cy ax. 90° p. r.=2.D; O.S.+1. cy ax. 90° p.r.=2.D. These glasses were worn for two years with comfort, when he returned and received at age fifty-two an additional +.50 for his reading glass.

It is not uncommon to have persons with relatively low grades of H. or M. with astigmatism in one eye, and very high grades on the other, use a full correcting glass for each eye with comfort. In all such patients the attempt should be made to secure their comfort by this means.

In other cases empirical corrections in some unaccountable way secure comparative comfort when more accurately adapted glasses cannot be worn. The following case will serve as an illustration:

Professor M., aged 48, has in O.D.—3.○—0.37cy axis 150°, V. 6/vi; in O.S.+1 sph.○+3.cy axis 80° V. 6/vi. The nose is turned toward the right side, the left side of the face is smaller than the right, the hearing of the left ear is defective without obvious cause. The left jaw is deformed, and the teeth are many of them gone on that side, while perfect on the right side. He received the above glasses in 1890, and has worn them constantly, enjoying comfortable binocular vision ever since. The reading combination, however, based upon his distance glasses could not be worn without constant annoyance. After a number of trials with various combinations and careful centering, it was found that with +0.37cy axis 60° over O.D. and the distance glass only, over O.S., he could read comfortably. In other words the left eye was practically abandoned for near work while being used with satisfaction for distant vision, but even for near work he preferred the correction for distance over the left eye to a plane glass.

The writer's experience seems to have demonstrated the wisdom of giving full corrections for each eye in every case, whether in anisometropia of the hypermetropic or myopic type, or in antemetropia. If comfort is not secured by carefully centered glasses, the attempt can then be made to abandon the more defective eye.

THE NON-SURGICAL TREATMENT OF MYOPIA.

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Myopia, whether *curvature or axial*, is so generally due to *abnormal* changes in the outer coat of the eye, and these, in turn, are so frequently followed by varied, and often serious, complications, that it may be regarded as a condition more or less pathological. When once developed, it is permanent and tends to increase, even to the extent of hazarding the sight through the stretching and disorganization of the retinal tissues, through choroidal disease or hemorrhage in the macular region, through exudates into the vitreous humor, or through detachment of the retina.

Unlike hypermetropia or astigmatism, it is not a congenital, but an acquired defect. A predisposition to it may exist in the infant; but practically it always appears after birth, and generally during the period of active growth and development of youth and adolescence. It is brought on by certain well defined causes, which it is more or less possible, although not always entirely practicable to remove.

Having before us, then, a pathological state which is incurable, and which tends to become serious, and one that is dependent upon well-ascertained and removable causes, prevention becomes preëminently important, both as regards its onset and its increase, when once developed.

Prophylactic treatment of myopia can only be administered in the light of the knowledge of its causes. These may be divided into predisposing and determining. The predisposing causes are such anatomical confirmations of the orbit and extra-ocular muscles and such make-up of the structures of the eye itself as may be transmitted from myopic, or perhaps emmetropic and hypermetropic parents to the child, or such vulnerability to the action of unusual forces found in the growing child, or such lack of resisting power of the ocular, as well as other tissues of the body, as accompanies want of bodily vigor and strength. The determining causes are such as are directly active, and consist essentially in *too near, and, at the same time too continuous ocular work.* Whatever theories may be advanced in explanation of the mechanism of the forces which produce myopia, whatever contributory conditions may foster its development, this casual condition is undisputed. Practically, the recognition of this fact is the basis of all prophylaxis, which may be briefly stated to consist in enjoining that objects shall be kept at a reasonable distance from the eyes, and that the visual effort shall occasionally be relaxed, and not continued for too long a time.

The question may be asked here, " What distance may be regarded as too near, and what time as too long? " An object, brought within a plane of fourteen or fifteen inches distant from the eyes, may be said to be too near for continuous and habitual work. Any time is too long that exceeds two or three hours of continuous near work, and in special cases one hour is too long. There is no doubt that perfectly normal eyes can, without harm, do close work for two or three hours, if a rest is then given them of about the same length of time before work is resumed again. In this way such eyes can aggregate a use of eight or nine hours daily quite safely. It would be unsafe, however, to undertake this maximum of time with any predisposition or increased susceptibility to myopia through heredity, active growth of the body, or debility. It should not be overlooked that myopia may also develop, even when the object is placed at the proper distance, if the work is continued unremittingly for many hours, day after day.

The disposition to hold objects too near the eyes arises from several causes, some of which may be referred to. In children and young people in whom the accommodation is active and strong, objects are brought " abnormally " near the eyes, because of the facility with which it is done, and the better definition of outline obtained. This often happens, even in cases where the vision is normal, or perhaps super-normal, both in emmetropic and hypermetropic eyes; it is almost universal where there is spasm of the ciliary muscle, or where the vision is subnormal from congenital amblyopia or uncorrected astigmatism or hypermetropia of high degrees, or where it is impaired by intra-ocular or other disease. Work on very small objects, or with insufficient illumination, is also a frequent cause.

In the one case objects are approximated too closely because of its facility, in others because of its need, and in all because of the increase in size of the retinal images, and, therefore, an increase in distinctness of vision.

The use of the eyes on near objects for a time exceeding that which may be considered safe, arises from the nature of tasks imposed, either voluntarily or by the demands of school life, or by the necessities of occupation. Many young people voluntarily spend hours, without remission and often in poor light and in faulty positions, reading the fascinating "literature" so generously adapted to their comprehension. The primary and high schools of the country set curricula before their pupils, including, besides the study of text-books, an enormous amount of writing, and in some grades much auxiliary reading. These requirements necessitate near and almost constant use of the eyes for many hours during the day, and oftentimes during the evening, as well. The same is true of many occupations, such as engraving, copying, fine needlework and many of the mechanical trades.

Without entering into minute details, it may be stated in general that to remedy the tendency to too near approximation, objects, especially the print of school books, should be of sufficient size to be easily and clearly distinguished at fourteen inches or more from the eyes. There should be ample, but not too intense, illumination, and the eyes should be protected from its direct action, either by the position of the head or body, or by a shade on the forehead or before the eyes. Seats and desks, or chairs and tables, should be so adjusted as to afford a healthful, comfortable and erect position of the body, and a suitable rest for the object, placed in a slanting position, and at a legitimate distance from the eyes. When the vision is subnormal from astigmatism or hypermetropia, it should be raised to the normal standard, if possible, by carefully adjusted, correcting glasses. In cases of amblyopia, or impaired vision from any cause, the objects should be correspondingly larger, or else the amount of near work should be greatly lessened. Spasm of the ciliary muscle should be relieved by instillations of atropia, rest, and possibly glasses. Any mere habit of approaching objects too near or inclining the head too much should be broken by discipline or, perhaps in urgent cases, by some of the well known devices for maintaining the head in a proper position.

To lessen the time of close ocular work is not always an easy thing to accomplish. It may be done in cases of unnecessary reading and work, and much of the writing and outside reading required of school children could be profitably dispensed with. But when a person is engaged in near-work occupation by the necessity of earning a livelihood, and cannot readily turn to, or obtain, "long-range" work, it must be continued. In such cases, and indeed in all cases, the visual effort should be relaxed for two to five minutes at least every quarter or half hour by looking into the distance.

When vision is below the normal standard of acuteness and cannot be improved, such regulations of school tasks, reading and fancy-work, and such choice of occupations should be made as will relieve the eyes from long and unremitting close application.

The maintenance of good health and bodily vigor is also a most important factor in the prophylaxis of myopia.

Could eyes throughout civilization be relieved of close and long continued use, the ordinary form of myopia would disappear. But in our present industrial relations this is impossible; but very much can be done in this direction with the result of greatly diminishing the frequency of a condition fraught with so many unhappy consequences. Physicians, educators and philanthropists have large responsibilities in this matter.

The treatment of developed myopia has to do with the prevention of its increase, the complications which may follow and the extension of the range of vision. To prevent its increase, and therefore those muscular "insufficiencies" and intra-ocular diseases which supervene upon its higher grades, the same precautions should be taken as in preventing its onset. Ocular work should be kept at proper distance, and it should not be continued beyond what may be considered a normal limit of time; or it should, perhaps, in markedly progressive cases, be greatly lessened, or discontinued entirely for a period of months, or possibly years. To extend the range of vision, correcting glasses are necessary, and these have the further important effect of facilitating the maintenance of near work at a proper distance, and of preserving the strength of the ciliary muscle and the normal relation between accommodation and convergence.

For more than a quarter of a century the teachings of the immortal Donders and later those of the distinguished Landolt have been largely accepted in the treatment of myopia. Their powerful authority has passed with few challenges, and to-day very many, perhaps the great majority of ophthalmologists are under-correcting myopia for near work. It is impossible within the limits assigned to this paper to review the arguments upon which this practice is based. These are set forth fully in the works of Donders[1] and Landolt[2], to which the reader is referred.

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[1] On the Anomalies of Accommodation and Refraction of the Eye. By F. C. Donders, M.D., London, 1864, page 420 et seq.

[2] The Refraction and Accommodation of the Eye and Their Anomalies. By E. Landolt, M.D., Philadelphia, 1886, page 483 et seq.

Donder says that "in very slight degrees, from 1/60 (0. 50 D.) to 1/18 (2.25 D.), we may leave the myope to himself, in higher degrees the neutralization. * * * In the highest degrees, from 1/5 (8.00D.) upwards, perfect neutralization is not pleasant for close work. * * * We should then rather bring *r* (remote point) to 12 or 16 inches." Landolt, after urging the determination of the real degree of myopia, lays down the rule that "A MYOPE MUST BE PROHIBITED FROM WEARING A CONCAVE GLASS FOR ANY DISTANCE AT WHICH HE CAN SEE CLEARLY WITHOUT ACCOMMODATION." To this he adds: "We will, therefore, guard against giving their correcting glasses to slightly myopic persons, and, generally, to all who work at a distance less than, or equal to that of their punctum remotum." Both Donders and Landolt advise against prescribing concave glasses which over-correct the myopia. Donders says: "While emmetropic and hypermetropic eyes do not readily experience any injury from the use of unsuitable glasses, this may in myopes, particularly on account of the morbidly sensitive condition of the eyeball, and of the tendency to get worse, be very dangerous. There exists in general a dread of the use of too strong glasses." Landolt puts great stress on spasm of the accommodation as an essential factor in the production and increase of myopia, and seems to be in constant fear that fully-correcting or over-correcting glasses will induce it. He says: "We have already seen, when discussing hyperopia, what complications result, in choosing spectacles, from this intervention of accommodation. Its influence is no less important to consider in the correction and adaptation of myopic eyes. The rôle which the contraction of the ciliary muscle may play in the etiology of malignant myopia makes this easy to forsee." He also seems to be guided in prescribing glasses very much by the wishes of the patient. "It is rare," he says, "that a myope whose defect is of medium degree and whose age is not advanced, is pleased with the full correction of his myopia." "Extreme myopes very often refuse any sort of permanent correction." He then proceeds to explain his practice at length, and even endeavors to establish the relation that should subsist between convergence (in meter angles) and accommodation or no accommodation.

Now facts are generally safer than theories in the practice of medicine or any of its departments, and such facts as have been presented by Foerster[1] of Breslau, and others, have positively demonstrated that concave glasses which over-correct myopia are not injurious, either in favoring its increase or in developing disease. On the contrary, it has been shown that such glasses, in fact, tend to arrest its progress by compelling a longer object-distance. Even Donders recognized that "when persons with moderate degrees of myopia have in youth accustomed themselves to the use of neutralizing spectacles, the eyes are in all respects similar to emmetropic eyes, and the myopia is, under such circumstances, remarkably little progressive." Let us take the facts, then, empirical though they may often be, and harmonize theories with them, if necessary.

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[1] Foerster, Trans. Heidelberg Ophthalmological Congress, 1883; also Knapp's Acrhives of Ophthalmology, 1885, page 399 et seq.

Facts have established that, normally, there is an intimate relation between accommodation and convergence, that with a stimulus to the one, there goes a stimulus to the other. Take away, then, the stimulus to accommodation, as in myopia, and there is lost an essential stimulus to convergence. The result is a tendency to, and finally a development of, insufficiency of the internal recti muscles. On the other hand, if the convergence is maintained by an active stimulus, an associated stimulus, perhaps much inhibited, is transferred to the accommodation with the effect of causing a true spasm, perhaps slight, of this function. This compels even a nearer approach of objects to the eyes than would otherwise take place, and a myopia becomes aggravated. It may be true that nature will permit a certain amount of dissociation between accommodation and convergence, but it can only be done at a sacrifice somewhere. The safest practice, then, is to balance as perfectly as possible the stimulus of accommodation with that of convergence, and this is done in myopia by increasing the accommodation by the use of correcting, concave glasses.

It is time to doubt the importance that has been placed on spasm of the accommodation in the production or increase of myopia. Every case of hypermetropia below forty years of age has spasm, more or less, of the accommodation. The same condition is present in every case of overcorrected myopia. But in neither case does it produce or increase myopia till after it becomes sufficient to force the far point of vision much nearer than "infinity," and thereby necessitating too close approximation of near work. If absence of accommodation tended to prevent myopia, every case exceeding two or three diopters would carry within itself its own remedy; but facts again prove that this is not true. Practically then, as well as theoretically, accommodation is not prejudicial to a myopic eye—is indeed beneficial, and should be preserved and exercised within the same limits as in any other eye, barring out, of course, pronounced diseased conditions.

Normal range of vision is as desirable for a myope as an emmetrope, and its advantages far out-weigh in most cases the diminution of retinal images by correcting glasses. The normal relation between accommodation and convergence is as useful and essential to the myope as to the emmetrope, for it guards against muscular insufficiences and assists in preventing an increase of the myopia.

The optical treatment of myopia, then, should be begun as early as possible, and at least as soon as it reaches or exceeds half a diopter. Its exact amount should be determined with the eye under the influence of a cycloplegic, and the full-correcting glasses should be prescribed. These should be worn both for far and near when the patient is under the presbyopic age and the ocular structures are not actively diseased, and when the power of accommodation has not been impaired by reason of the myopia having remained uncorrected for a considerable period of time. In cases of young people, in whom the accommodation has thus been impaired or lost, and who are engaged in near work of considerable amount, a second pair of glasses should be used for this purpose, varying in strength from one to three diopters less than those for distance, according to the state of accommodation. Those for near should be gradually increased in strength till the full-correction is reached, and then these should be used for all work. In this way the accommodative power is entirely regained, and the eyes, with the glasses on, are used the same as though they were emmetropic. It is not a result always easily accomplished, but the benefits derived atone many fold for the discomforts of the effort.

When presbyopia appears, weaker glasses are needed for near, adjusted in accordance with the rules governing the correction of this condition in emmetropia.

When myopia is so extreme that its full correction, although giving, perhaps, nearly or quite normal vision, renders the retinal images so small that near objects, such as ordinary print, are clearly distinguished only with great effort, weaker glasses, according to the circumstances, should be used for near work. Sometimes in these cases the visual effort for far, even, is so great with glasses that fully correct, that the indistinctness of an under-correction is much preferable to its discomfort, and weaker glasses should then be worn for distance, as well as near.

When pathological changes have reduced the acuteness of vision considerably below the normal standard, the optical correction of the myopia must be governed largely by the conditions present. Sometimes nearly a full correction is acceptable, sometimes only a partial one, and sometimes none.

The non-surgical treatment of such complications of myopia, as choroidal disease, retinal hemorrhages, vitreous opacities, and detachment of the retina is so negative that its consideration need not occupy us at this time. It may be summed up in *ocular rest and hygiene.*

As regards the muscular insufficiencies attending myopia and the "muscular asthenopias" to which they give, their non-surgical treatment consists in wearing prisms combined with the spectacles, or in decentering glasses, which has the same effect, and in the "exercise" of the weakened muscles by prisms or other means. Prismatic spectacles often give great relief, but it is so difficult to change an established abnormal innervation, or, in other words, to break up an old "muscular habit," that prismatic or gymnastic exercises must be begun early if relief is to be expected from them.

This whole subject is so large that much more might be said upon it, but these brief considerations must suffice for this occasion. It must not be expected that anything new can be said at the present time on the topic before me. But it is expedient, nevertheless, to emphasize anew the importance of the prophylaxis of myopia, and to urge what seems to me to be an optical treatment of it more in consonance with verified facts and best results.

THE SUBJECTIVE METHOD FOR THE DETERMINATION OF THE REFRACTION.

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In the estimation of the refraction of the dioptric media and the correction of the errors with glasses, the objective method is of great importance, so much so, that all oculists should be able to order glasses, in the majority of cases, by the objective method alone. This requires a vast amount of experience, with the education of the examiner's eye, to appreciate and to estimate the many and various conditions in the refraction of the examined eye. Hence, many of us must depend, in great measure, upon the subjective methods for the diagnosis of what is the refractive condition in the case to be examined.

It has been stated that the trial case is the chief element in the estimation of the refraction, as we must consult our patients' wishes and comfort in the wearing of the glasses and so we are apt to decide the question by the glasses that they prefer. Be that as it may, I never order glasses that a patient may like unless I can verify their preference by all the objective methods.

Although we may give the subjective methods a second place in the estimation of the refraction, it is one of great importance; and these methods should be used in a practical way, that we may obtain rapidly the refractive condition of the media.

Of all subjective methods the trial-case stands first, and it is useless to attempt this work without one of the best, with a full set of spherical and cylindric glasses. Armed with this, we can test our patients intelligently and read the indications as we proceed.

The test-type should be placed in a well lighted room and, if possible, have the type illuminated with artificial light. We should have two or more cards on the wall at a distance from the patient of twenty feet. I use in my office three cards fastened on the wall like the leaves of a book, so that they can be rapidly changed, frequently using a different card for each eye. The patient to be examined is placed in a chair with the back to the light, and we record the binocular vision.

Before proceeding to illustrate the test, we must remember that the age of our patient will have a very decided influence on the acuity of the vision and the concealment of an error of refraction. In old people, beyond the age of forty years, the action of the ciliary muscle will have very little influence in the acceptance of the proper glasses, while on the other hand, in young persons, the action of this muscle will frequently conceal an astigmatism, particularly when we are using Green's test-card with the radiating lines, and the astigmatism is hyperopic. In these young persons we must also be on our guard for accommodative myopia, the clonic spasm of the ciliary muscle, shown by the vision being improved by the use of weak minus glasses without perfect vision. We now proceed to test each eye separately with the trial-case. Covering one eye with the shield, we note the acuity of the vision in that eye; if normal, it equals $\frac{20}{20}$ or better, or it may be less. In my work I consider $\frac{20}{15}$ as normal vision. If the vision is normal we have an indication of simple hyperopia, or some form of low astigmatism, and we should not look for myopia unless the vision is less than $\frac{20}{100}$, and they can read No. 1 Jaeger test-type.

Having found the vision equals $\frac{20}{20}$ or better, we now proceed to bring out the refractive condition by the "trial by glasses," proceeding first and always with the *plus* sphericals. If accepted, we place the glasses successively before the eye until we find the strongest plus or convex glass through which the vision will be the same or will be improved, as there must be no blurring of the letters with this glass. The glass used will then represent that a certain amount of hyperopia is present, that may be in only one meridian, as cases of hyperopic astigmatism will frequently accept these glasses, but this is shown as we develop the true refractive condition.

Using this strong plus spherical we now place over it a weak *plus* cylindric glass with the axis placed horizontal, and then change the position of the axis 45° each time that it is moved, and note if the vision remains the same, is improved or is made worse, with the position of the axis, in which the vision is best. Finding this position, with the strongest cylindric glass we note if the vision is the same or better. If improved then we must have *compound hyperopic astigmatism* and the glasses used indicate the degree and the axis required.

On the other hand, if the vision is not improved or diminished we now proceed to use minus cylindric glasses in the same way, and if the vision is improved we add stronger glasses until we get the best vision. If the minus cylinder is weaker than the plus spherical we still have compound hyperopic astigmatism, but of a less degree and a simple calculation will show the glass needed: as if we use a + 1 D. ⊃ — 0.50 D cyl. ax. 180° this equals + 0.50 D. ⊃ + 0.50 D. cyl. ax. 90° = the glass required.

Again, if this combination does not give us the required vision, we continue to add the minus cylindrics until we have one of the same refractive power as the plus spherical first placed before the eye, and this giving perfect vision we now have *simple hyperopic astigmatism*, and a moment's calculation will give us the plus cylindric glass and the axis required; as + 1 D. ⊃ — 1 D. cyl. ax. 180° equals + 1 D. cyl. ax. 90°.

In case this trial will not bring the vision up to $\frac{20}{20}$, we proceed to place stronger minus cylindrics before the eye until we do find the vision normal, and now we have brought out the condition of *mixed astigmatism*. From the glasses used we may readily estimate the degree of hypermetropia and myopia in the two principal meridians. I would illustrate that in this way: R. E. V. = $\frac{20}{40}$, with + 1 D. = $\frac{20}{30}$; now we add the minus cylinder, say — 2 D. cyl. ax. 180° and this glass gives V. = $\frac{20}{20}$, or better. Then we have hyperopia of 1 D. in the horizontal meridian, with myopia of 1 D. in the vertical meridian, and we can order whatever combination of glasses that will give the same result. In ordering glasses for mixed astigmatism, I always prefer to use the minus sphericals combined with the plus cylinders, as I think this combination gives the best periscopic vision.

If the addition of the plus or minus cylinders as above described tend to make the vision worse, then we must have *simple hypermetropia* and the glass may be ordered accordingly.

In case the vision is very much diminished, and we can find no improvement with the plus glasses, we may now use the minus sphericals, using the weakest glass that will give the best vision, and if necessary, then proceed to place over this, first plus cylinders to bring out a low degree of *compound myopic astigmatism*, and when we have the plus cylinder the same as the minus spherical with vision normal, we have *simple myopic astigmatism.* But if these glasses make the vision worse, now we try the minus cylinders with the axis placed at the different positions of the arc of the circle, until vision is normal, when we have demonstrated compound myopic astigmatism of a higher degree and the weakest spherical combined with the weakest cylinder will give the glass required. Again, all cylindric glasses failing to improve the vision then we must have *simple myopia.*

The foregoing method with the trial glasses and Snellen's test-type, with reasonable care and trial, will in most cases indicate the refractive condition of the dioptric media and the glasses required; but following this subjective test we may use others as confirmatory and to verify our results. Chief of these I would note Green's test-card with the radiating lines. The only objection that I may note in reference to this test, is that in young persons, with the lens elastic and the ciliary muscle active, they will often state that they see all the lines clearly in every meridian, particularly so in cases of low hypermetropic astigmatism, but in using the trial-case, as before mentioned, this objection will disappear and they will indicate the lines that will appear most distinct as we place the plus glass before the eye.

We will then proceed to test the refraction in reference to the appearance of the lines; always remembering that the lines will be seen most distinct in the meridian of greatest ametropia, consequently the axis of the correcting glass will necessarily be placed at right-angles to the position of the lines.

In simple myopic astigmatism this test will always be useful, as now they cannot conceal the astigmatic condition and in most cases they will readily note that the vertical lines are very clear, at once indicating myopia in the vertical meridian. These lines are seen because the rays of light in the horizontal meridian or plane are brought to a focus on the retina with the eye at rest, as this meridian is emmetropic; thus the edges of the vertical lines are clear, while the rays in the vertical meridian overlap but simply render the ends of the lines indistinct.

By the same rules, if the greatest curve of the cornea is in the horizontal meridian then the corresponding lines will be clear and in both conditions the weakest concave cylinder glass, with the axis placed at right angles to the lines, which will make all the radiating lines clear, will give the desired degree of astigmatism and the axis required.

Another confirmatory test with the trial-case, is the use of the stenopaic slit, by which we cut off most of the rays in one meridian or plane and estimate the refraction in the other. Here we find the position of the two meridians that give the best and the worst vision at right angles to each other. Selecting the meridian, in which the vision is best, we proceed to test it with the trial glasses that will improve the vision, and then test the other meridian in the same way. As we note the vision and the glass used in each meridian we can readily calculate the refractive condition and the glass required.

It has been suggested that we should, in all cases, endeavor to measure the astigmatism first, but this is very difficult to perform unless we use some of the objective methods first; so I prefer to find the axial ametropia and then work out the astigmatism, hence I have endeavored to illustrate a method that may develop the refractive condition as we proceed with the subjective test. I am well aware that the objective methods, particularly that of Retinoscopy, will rapidly indicate the astigmatism and the axis of the correcting glass, but to be proficient in the use of the Retinoscope requires constant practice, while the method described will rapidly indicate the refractive condition to those not familiar with the objective methods.

The demands of civilization are so great at the present day, requiring exhaustive and constant work for the eyes, and the refractive conditions of the dioptric apparatus are so extremely complicated, particularly in the low degree of astigmatism, that the day of the traveling optician and the use of Optometers and Refractometers is surely passing away; while the correct fitting of glasses for the improvement of the vision and the relief of reflex symptoms must require the services of the skilled oculist. He will be required to make a correct diagnosis, in which, all observers should agree, is similar to a mathematical problem, and such work cannot be done by the man who says, as the office bell rings, "Oh, here's another refraction case," but by the most careful estimation of the refraction we will correct an error that will be permanent and satisfactory.

This may require many moments of painstaking work but will meet its reward in the end.

A short time ago a case was sent to me, asking if I could find any astigmatic error, as the last examiner could not find such a condition and yet he had noticed that the patient was wearing a glass of — 12 D. ○ — 2 D. cyl. ax. 90°, in each eye. Now a patient with so high a degree of myopia may accept a cylindric glass at almost any axis, but after the most careful examination I was compelled to decide that this was a case of simple myopia, (axial) and consequently the glasses could not be correct, while the patient never was satisfied with the glasses since they were ordered, and I gave him simple concaves.

In conclusion, while I have endeavored to outline the procedure that I consider the best in the subjective examination of the refraction, yet in my own work, while I use the same method, I never order the correction until I am satisfied that the results of the subjective method shall agree, to all intents and purposes, with all the best objective tests.

Under these conditions we will seldom have to change our prescriptions for glasses nor fail to give the desired relief.

146 East 37th Street.

(1.)—SOME POINTS CONNECTED WITH SARCOMATA OF THE CHOROID. (2.)—GUMMA OF THE CONJUNCTIVA.

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Illustrated.

Malignant tumors of the eyeball are always of great interest both to the surgeon and also to the pathologist; this to a great extent arises from the small amount of knowledge we possess with regard to them. They nearly always present some difficulties to the surgeon from the point of view of diagnosis, while their ætiology is practically unknown.

I shall in this communication confine myself almost entirely to the pathological side of the question, and as I have recently had occasion to examine a few specimens which are rather out of the common, I hope that the consideration of them may prove instructive.

By far the larger number of cases we meet with occur in eyes which have until recently had good sight, though it is by no means uncommon

to find the history that the eye has become blind gradually, and often so gradually and painlessly that the patient was unaware of any defect until the good eye was closed, and then the defect became at once apparent. If such a case has gone on for a long time, it may suddenly become hard and painful, and all the symptoms of an acute glaucoma come on rapidly.

This, however, is not the only way in which a growth manifests itself, nor are they always good seeing eyes that become affected. Sometimes blind eyes are found to contain growths, and one occasionally meets with eyes which have been blind and divergent a very long time, becoming affected, and even an eye which has been shrunken for years and contains bone becomes the seat of a tumor.

The following case is a typical example of the latter condition:

Miriam W., aged 50, gave the following history: Thirty-six years ago the right eye was injured with a skipping rope, and after the accident the sight completely left. The eye then became shrunken, but remained absolutely quiet and free from pain until eighteen months ago, when, without any apparent cause, it became inflamed and irritable; there was no injury or exposure or anything to account for its becoming painful. The pain has been severe during the last two or three months before admission. When seen, the eye was shrunken, hard and very painful on pressure. There was, however, nothing to indicate the true nature of the condition. As the eye was useless, as well as very painful, excision was advised. On removal the following condition was noted: The cornea is very small and there is a deep arcus around it. The iris is not visible, but a dense white calcareous lens is seen in the pupil. At the upper and back part of the sclera there is a very large bulging melanotic mass, a process of this surrounds the optic nerve, which is itself of a very dark color. The tumor, which surrounds the nerve, has been cut through, so that obviously the disease extends beyond the point of section. As soon as this was recognized the whole contents of the orbit was removed. An antero-posterior section of the eye was made. It was then noted that the eye is solid throughout and on the posterior part of the sclerotic there are two large staphylomatous bulgings which are composed of coal black melanotic growth. The interior of the eye is occupied by a dense mass of bone, measuring 13 mm. in one direction and 5.5 mm. at right angles to its long diameter. This has evidently become developed in the choroid which is entirely surrounded by a dense sarcomatous mass. The optic nerve is surrounded by the mass. The lens is hard and calcareous, but the other anatomical structures of the eye are unrecognizable.

This is a typical example of the folly of a patient allowing a blind and painful eye to remain for a very long time without seeking relief, and such a case should be a warning to surgeons, many of whom are inclined to err on the side of being too conservative, in preserving eyes which are blind, useless, and perhaps even disfiguring. One might be perfectly certain that an eye which has been blind for a number of years is very unlikely to become painful unless some gross change has occurred, and if this be the case, the sooner such an eye is parted with, the better.

Some people talk about the occurrence of new growths in blind bony eyes as commonly happening, and no doubt a fair number of cases have been seen, but still one does not often see such. One might perhaps look upon them as being relatively common; for when one considers the few cases there really are of persons possessing bony eyes, the occurrence of one case in about one hundred which I have examined, is perhaps not such a very low proportion after all, and fortunately sarcomas of the choroid are by no means common, when one finds at Moorfields about one sarcoma in between three thousand and four thousand cases.

Without in the least wishing to multiply cases, one cannot help mentioning the following, which shows how a tumor may be masked to external appearances and may yet be making rapid progress in the orbit:

This patient was a man aged 55, whose left eye had been defective and divergent for at least twenty years. For the last three or four years he had had attacks of pain and inflammation in the eye, but delayed having anything done. There was nothing whatever to indicate the fact that there was anything further the matter other than subacute inflammatory attack. The eye of course was quite blind. It was decided to remove it, and then for the first time the true nature of the condition became apparent. It was found that after the muscles were divided, the eye refused to come forward. It was, however, removed with some difficulty, when it was found that a dense coal black sarcoma had destroyed the sclerotic and was projecting into the orbit. On opening, the eye was solid and completely full of a melanotic growth. The center was soft and broken down, while the rest was harder, the sclera was much thinned and the growth visible within it, while at one place near the optic nerve, it has completely penetrated, and a portion has been left in the orbit.

This again illustrated the fact that should never be forgotton, viz.: that it by no means always happens that the growths penetrated the sclera in a position which can be seen as frequently as it does so much farther back.

Now the position in which these intraocular growths penetrate the sclerotic follows a definite plan, and that is, they find their way through the places which are pierced by vessels and nerves. As one would expect, the position of the large venæ vorticosæ is one of the most common places where this occurs, and if this is so it does not take long to recognize the probable nature of the case. Another common place for tumors in the ciliary region to penetrate is along the line where the anterior ciliary vessels run. This again is particularly easy to see, and so one finds it very uncommon to have a large growth projecting in this situation. The worst place of all for it to occur is in the situation where the posterior ciliary vessels penetrate, as was the case in the patient mentioned above. This may go on for months before giving rise to any marked symptoms other of course than blindness, with more or less detachment of the retina.

In this case, however, we are almost certain to have acute tension sooner or later, as the growth is far back away from the ciliary body. One cannot say how this is, but the fact remains that we are far more likely to get increase of tension in cases in which the ciliary body is not affected than in cases in which the growth is far forward.

The point was most obvious in a large number of cases examined by the author, the results of which were published in the *Transactions of the Ophthalmological Society of Great Britain* for 1896, when, out of a total of fifty-three cases of sarcomata not affecting the ciliary body, 67.92 per cent had a greater or less increase of tension; while in twenty-eight cases in which the ciliary body was affected, the percentage of cases showing glaucomatous changes was only 35.71.

On further examination, it was found that the high tension was invariably accompanied with a closed angle of the anterior chamber, and that this closure was far more frequent in cases of choroidal growth occurring far back in the eye than in those in which the ciliary body was involved in the tumor.

Now there must be some reason for this, though certainly it is the reverse of what we should expect to find. One would certainly think it probable that a sarcoma growing far forward would be more likely to cause the anterior chamber to become shallow and the angle restricted, than when the growth is far removed and is in the back of the eye. Doubtless this would be the case supposing this were all, but we must remember that the ciliary body takes a most important part in the nutrition of the eyeball, as should anything interfere with its function, changes of a greater or less degree are sure to occur. It is quite easy to imagine that, even supposing the angle of the anterior chamber be very much narrowed as the result of a growth far forward, the presence of the tumor may not only aid the filtration of fluid from the chamber but may also tend to prevent the angle entirely closing, and thus prevent the development of an acute glaucoma. This seems to be the most likely explanation of the condition which is at first sight the reverse of what we should expect.

The only way of elucidating the various interesting points in connection with this important class of cases is for surgeons to carefully examine their cases, and should they be unable to do so themselves, our knowledge would be greatly increased if all eyes were subjected to strict pathological examination, as one so frequently finds most interesting things in eyes and tissues in which we least expect to do so.

Gumma of the Conjunctiva.—One is familiar with certain new growths occurring in the conjunctiva, and perhaps rodent ulcer starting in the lids and secondarily affecting the conjunctiva is one of the most common. Intense thickening of the conjunctiva as the result of tertiary syphilis is by no means common. And indeed this thickened condition of the conjunctiva is sometimes seen during the occurrence of secondary syphilis. A case of this sort was under treatment at Moorfields for two months during the time the author was house surgeon; but although the patient had numerous signs of secondary syphilis and was vigorously treated for this, yet the infiltration of the conjunctiva made little or no improvement during the time he was under observation. The case was reported in the *Trans. of the Ophth. Soc.*, 1894.

In Volume XI of the same Transactions, there are two cases reported and figured, one by Silcock, of a gumma occurring in a patient aged forty-five, who had had relapsing iritis and gummata in various parts of the body for some years. There was in this case a large swelling at the outer part of the conjunctiva. It disappeared in about a month under the influence of mercury and iodide of potassium. The other case recorded by Lawford, occurred in a man, aged forty-eight, who had had syphilis twenty years ago. There was on the temporal side a round, smooth subconjunctival swelling close to the external rectus muscle, and had been present for two or three years.

The following case is interesting, inasmuch as the eye was obtained for pathological examination and the infiltration very diffuse:

It was from a man, aged seventy years, with a specific history who was suffering from hemorrhagic retinitis; he then developed subacute glaucoma. The eye remained painful for about two years and then ceased to be troublesome for about a year, again becoming painful after this.

There was then enormous thickening of the subconjunctival tissue all round the cornea, which extended far back.

The eye being blind and painful, was excised.

During the operation it was found that the muscles and fasciæ were greatly thickened, and resembled a condition of solid œdema. It was not adherent to the globe.

On microscopic examination, the whole of the subconjunctival tissue is enormously thickened, and so densely infiltrated with small round cells that its structure is not visible; these cells are packed together. Running through the mass are numerous blood channels, but there are no well formed vessel walls.

Near the surface the cells stain deeply, and are apparently of recent origin and actively growing, while those in the deeper parts of the growth do not take the nuclear stain at all well and are apparently in a somewhat degenerate state. The growth of cells pushes itself beneath the corneal epithelium at its margin. The sclerotic is somewhat infiltrated, though, owing to its density, the cells do not travel far into it; the growth is in many places broken down with hemorrhage. The iris is very greatly atrophied, it is thin and adherent to the cornea on both sides for a considerable extent, thus completely closing the angle of the anterior chamber. It is infiltrated and has evidently been much inflamed. There is considerable ectropion of the uveal pigment. Some of these features are shown in the accompanying photograph, taken under a two inch and two-third inch objective without eyepiece.

Krauss claims optic neuritis to be present in 90 per cent. of all brain tumors. It is oftener present in cerebral than in cerebellar tumors. The location of the tumor exerts but little influence over the appearance of the nerve. The size and nature of the tumor has but little influence over the appearance of the neuritis. Slow growing tumors are less likely than rapid ones to be accompanied with neuritis. He believes that unilateral choked disc is indicative of disease in the hemisphere corresponding to the eye involved.

Ocular Affections of Utero-Ovarian Origin.—In ocular affections connected with utero-ovarian trouble—which are more frequent than usually supposed—Professor Mooren relieves the tenacious hyperesthesia of the retina with the following: Potassium bromid, 4 grams; lupulin, 6.5 grams; pulv. rhubarb, 1.5 grams; extract of centaurea, q. s. Make into 120 pills. Take three pills three times a day. If the ovary is the cause of the ocular troubles he gives: Atropin sulphate, 3 centigrams; licorice powder, 2.5 grams; extract of licorice, q. s. Make 60 pills. Take three pills a day. If the reflex ocular irritation depends upon some simple functional disturbance in the uterus or ovaries he administers Paracelsus' elixir in the dose of two half teaspoonfuls a day for several weeks, in the case of robust patients, otherwise reducing this amount to a quarter teaspoonful, or merely several drops during the few days preceding the menses. A copious metorrhagia may induce a serous effusion of the retina, or a neuro-retinitis, which are relieved by cold compresses or ice to the back of the neck, with leeches to the mastoid epiphyses and saline purgatives, if necessary. Local treatment to remove the cause in all cases. —*Semaine Méd.*, September 28.

THE

OPHTHALMIC RECORD.

A MONTHLY REVIEW OF THE PROGRESS OF OPHTHALMOLOGY.

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EDITORIALS.

VISUAL REQUIREMENTS FOR ENTRANCE TO WEST POINT.

That the government should accept only the flower of American manhood to prepare for military duty, should seem wise to any thinking mind. Physically and mentally, the accepted cadets should be above criticism. Were not such the case, these cadets who are some day to fill the most important official positions in the army, would by virtue of their own shortcomings permit the standard for admission to the ranks to be lowered. An error of refraction of a kind that will lower the distance vision is a physical defect. The government makes it a disqualification in the entrance examination at West Point. While we recognize the wisdom of accepting well educated, and physically perfect men who have good eyes. the question arises, what are good eyes? The government insists that the eyes must be free from disease, and that the vision must be 15/20 in at least one eye, and not less than 10/20 in its fellow. The test is to be made without glasses. We all know that the emmetropic eye is extremely rare. The government evidently recognizes this fact, inasmuch as perfect vision is not demanded. It is a rule of the examination that because glasses will raise the impaired vision of the ametropic eye, it shall have no mitigating influence in favor of the candidate. Yet, notwithstanding an error of refraction, if the candidate has sufficient vision to squeeze through, he can the next day put on his glasses and continue to wear them the remainder of his days. This would seem to be unjust. Given two candidates of equal physical development with the exception of their eyes. One has two dioptries of hypermetropia; the other two dioptries of astigmatism. The former is able to accommodate for his refractive error and pass with perfect vision. His companion fails because of vision of 1/3. Take these two men at the age of fifty-five, at an age when they will have reached important positions in the army, and it will be found that without glasses, the man with two dioptries of astigmatism will have better distance vision than the man with two dioptries of hypermetropia. This is where the examination is faulty. If it is desirable for the accepted candidate for West Point to have vision of 15/20, the accommodation should be suspended with a cycloplegic and the vision tested with the eyes in this condition. This will bring into prominence errors of refraction that would otherwise be overlooked and would require correction by glasses because of asthenopic symptoms or lessening of distance vision resulting from accommodative failure incident to age. If glasses are not considered an impediment to military proficiency, then within a certain limit ametropia should not disqualify. As the requirements now stand, glasses are considered an impediment, or their use would be permitted at the time of examination. It is evidently the desire of the government that the army shall not be bespectacled. We quite agree with the government. In time of peace only perfect physical specimens of manhood should be accepted for military education at West Point. The examination of the eyes should be conducted with the accommodation suspended, when refractive errors which may in later years prove a menace to vision unless corrected by glasses may be easily detected. M. B.

THE NEGLECT OF OPHTHALMOSCOPY.

The perfecting of skiascopic methods, the better understanding of ophthalmometry, and the recent improvements in those instruments that render the objective measurement of the refraction of the human eye comparatively easy and accurate, have been accompanied by some serious drawbacks.

That one might be able to determine exactly the refractive state of a patient's dioptric media without his aid was, in former years, justly regarded as a consummation devoutly to be wished, and now that we have so decidedly overcome the difficulties of the task, and are indeed able to accomplish it easily and readily, must surely be regarded as a triumph of modern ophthalmic art. There is, however, this objection to several forms of objective measurement—it teaches the observer, while paying much attention to the refraction, to be neglectful of the condition of the fundus. Many influences are at work to bring about such a result.

In the older days, the ophthalmoscope was, practically, the only instrument the ophthalmologist possessed for the objective examination of the refraction, and, although only a slim minority were able to use the instrument with any approach to precision, every oculist did employ it as a daily routine, and with it the eyegrounds were closely scanned. Not only were the macular and papillary regions always examined (incidentally perhaps) in the search for some friendly vessel whose appearance and position might enable the observer to prove the presence, or absence, of astigmatism, but minute changes in the fundus coats and in the media were pretty certain to be detected. In this search, also, even the periphery of the background was usually examined with care. Now, however, the refraction ophthalmoscope is pretty well abandoned, and the skiascope has largely taken its place. Or, to be more definite, objective optometry with the ophthalmoscope has been neglected for the skiascope and ophthalmometer. When one remembers that many serious diseases of the eye, recognizable only with the ophthalmoscope, may exist with perfect central vision, and how difficult it often is to differentiate their symptoms from those of refractive anomalies and accommodative errors, the necessity for the routine use of the ophthalmoscope is all the more apparent.

This tendency to exalt objective optometry at the expense of ophthalmoscopy is seen in the teaching of skiascopy in "Schools of Refraction," and even in post-graduate schools and colleges. The student soon finds that he can "fit cases" even if he never sees the ocular fundi; he also soon decides that the time expended in laboriously peering through the pupil is more "practically" spent in perfecting his knowledge of the shadow test. There is, it is to be feared, some real danger of our training a class of ophthalmologists whose work will be little better than that of opticians, who will regard every patient as a fit subject for glasses, who will think of the eyeground as a kind of reflector for the skiascope rays, and who will, consequently, often fail in their efforts to relieve the ocular distress.

It seems proper, therefore, at this time that every teacher of ophthalmology should insist upon, and every ophthalmologist practice, the good old rule—*before you determine the refraction, examine the fundus.*

C. A. W.

REPORTS OF SOCIETIES.

OPHTHALMOLOGICAL SOCIETY OF GREAT BRITAIN.

October 20, 1898.

Mr. H. R. Swanzy, the President, occupied the chair.

Mr. J. F. Bullar and Mr. C. Devereux Marshall communicated a paper on *Glioma of the Optic Nerve.* The case upon which the paper was based was that of a woman aged thirty-seven who noticed nothing the matter with the eye until 1889 when the left eye became more prominent than natural. This condition increased until 1895 when Mr. Bullar operated and removed the tumor, with the eyeball attached. Immediately behind the eyeball the nerve was of normal size and appearance for a length of 15mm. It then formed a pyriform shaped swelling measuring 15mm. long and 20mm. wide. A cyst-like cavity was formed inside this which was opened during the operation and which was found to contain some straw-colored fluid. On opening it the interior was found to be rough and vascular and had a fatty appearance. The tumor was encapsuled, and the optic nerve was completely lost as soon as it entered the tumor, and it was not again seen at the posterior part as the growth extended at least as far as the optic foramen and probably further still. It would have been impossible to have removed more than was done.

The patient did quite well after the operation and has since married. The tumor was proved by microscopic examination to have originated in the neuroglia; the authors have therefore termed it a glioma of the optic nerve. The eye was normal.

In the literature of the subject 130 cases of tumors of the optic nerve were found, and the results of these showed that these tumors were of slow growth but should be classed as malignant as they were liable to extend into the brain, although metastasis was not found. The question of growths of all sorts met with in the optic nerve was then discussed, and although the different terms applied to them were legion, yet Mr. Marshall was strongly of opinion that the majority of them would fall into one of three groups: (1) Those originating in the neuroglia which should be termed "gliomata;" (2) those originating in the dural sheath, "sarcomata;" (3) those originating in the pial sheath, "endotheliomata." Statistics had been worked out which proved that the disease was much more likely to occur during the first twenty years of life and a very large proportion occurred before the tenth year.

The result of operative procedures was gone into and although the results obtained by removing the growth without the eye were by no means bad, yet the authors thought that the safest thing to do was to treat them in the manner of malignant growths in other parts of the body and to remove the growth as freely as possible. Mr. Bullar made some remarks on the chief features of the operation, and the whole paper was illustrated by a lantern demonstration, with photographs taken by one of the authors.

The President remarked on the rarity of the disease, he having seen but one case.

Mr. Lawford referred to a case of Mr. Rockliffe's in which it was impossible to remove the entire growth, and in which no evil result had followed.

Mr. Treacher Collins commented on the great variety of names that different authors had given to this group of neoplasms and he thought that the best classification was an anatomical one like that which had been suggested. The optic nerve was a prolongation of the brain substance, and gliomata of the optic nerve far more resembled in structure those of the brain than those of the retina which approached the embryonic type in their cell formation.

Capt. H. Herbert, I.M.S., made a communication on the *tension of the eye in irido-cyclitis*, based on observation of 144 eyes affected with the disease. In the majority of attacks, more especially in the milder ones, the tension was as in simple hyperæmia of the iris and ciliary body, reduced, and this persisting as a rule at least as long as any ciliary injection remained. In other cases a period of high tension of variable duration came on.

The high tension appeared to be due to blockage of the normal outlets from the anterior chamber, and the eyes chiefly affected were, (1) those very severely attacked, with copious exudation, and (2) eyes perhaps lightly attacked but predisposed to glaucoma as shown by shallow anterior chamber in the sound fellow eye and by the more or less advanced age of the patient. In these high tension cases the anterior chamber was deepened and the pupil slightly dilated. In the most intense cases of inflammation the plus tension quickly gave way to softening; which might be permanent and which indicated atrophy of the ciliary body.

The mild attacks were of the nature of primary subacute glaucoma and were interesting because of difficulties of diagnosis and treatment, there were no grounds for attributing high tension to cyclitis as distinguished from iritis.

He made use of Priestly Smith's tenometer very largely in estimating tension.

Mr. Priestly Smith said that the principles enunciated by Captain Herbert were now generally accepted. There were two processes, mutually antagonistic, concerned in the regulation of tension in irido-cyclitis; one was the suppression of secretion, reducing the tension, the other was the formation of an albuminous exudation hindering filtration and raising the tension. He had been glad to find the tenometer he had introduced had proved serviceable in this investigation. He made some experiments some years ago on tension in which a perfectly limpid albuminous fluid obtained from a serous cavity had been injected into one eye of a cadaver and normal saline solution into the other. In the former it was only with the greatest difficulty that the fluid could be made to drain out of the normal channels, while in the latter the fluid passed without the least difficulty and drained away, thus showing that albuminous fluids will not pass through animal membranes without great pressure.

The following card specimens were shown: Mr. R. M. Gunn: Case of Retinal Diseases; Mr. R. D. Batten: Superficial Central Choroiditis.

CHICAGO OPHTHALMOLOGICAL AND OTOLOGICAL SOCIETY.

NOVEMBER 8, 1898.

The president, Dr. W. F. Coleman, in the chair.

The question of the society becoming affiliated with the Chicago Medical Society was brought up and discussed, and on motion of Doctor Ware the society voted in the affirmative.

Dr. Clark W. Hawley presented a case of *Traumatic Cataract with Dislocation of the Lens* with the following history: A year ago this summer this man belonged to the State militia, and while attending to his duty in the artillery, stood at the side of the gun when the firing was going on in practice. Nothing occurred for nearly a year. He still belonged to the State militia, but when it was sent out to join the regular army he had to pass his examination the same as the other soldiers. This was some time in May. He had an examination for entrance to the army and both eyes at that time were apparently normal, so far as the examination showed. After going South with the army he noticed a defect in the left eye. The surgeon who examined him, told him he had a cataract forming. After a time he sent him North to have something done for it, and his discharge papers were made out. On examination Doctor Hawley found a soft cataract, and that is about all that is known of the case. He tried hard to find some history of injury, but the patient does not know of a blow or injury of any kind happening to the eye. He has never had disease of any kind that he knows of. Two weeks ago to-morrow a needling was performed, atropin being instilled into the eye beforehand, and the needle was carried through the cornea and the anterior capsule punctured, running the needle well into the lens and withdrawing it, not making any attempt to cut the capsule or stir up the lens. On examining the eye afterward nothing abnormal was seen. A small bead of lens showed itself where it had been punctured. The next morning, when the bandages were removed, a singular accident was shown, which occurred some time between the time of the needling and that morning. The lens had become dislocated, simply turning upon its vertical axis, from the nasal portion of the eye toward the outer, so that it stood, when first seen, very nearly vertical, slightly slanting toward the inner aspect of the eye. The anterior surface of the lens looking toward the temporal side. The edge was very closely defined. The lens was enormously swollen, so much so that the anterior edge touched the cornea. The iris was fully dilated by the atropin, and the upper and lower portions could just barely be seen above and below the lens. After discussing the matter with Doctor Starkey, it was decided that the best thing to do was to let it alone and not attempt to remove the lens, because it would be difficult indeed to make an incision for the extraction owing to the position of the lens, which was so swollen that if any attempt had been made to do an extraction even in a diagonal direction, it would have been necessary to pass through the lens. The eye has been watched from day to day; there has been no increase of tension up to yesterday morning, at which time the condition was as follows: The lens, or most of it, was posterior to the pupil; one small portion at the lower part was hanging over the border of the pupil into the anterior chamber. There seemed to be a little finger-like projection at the lower portion of the lens where it had been caught in the capsule. In watching the lens from day to day we could see the changes going on, it becoming more opaque and smaller. In the beginning it was sufficiently opaque, so that the patient could barely make out figures as you pass them before the light. There has been very little irritation, no pain, no iritis, no increase of tension up to the present time. Absorption is going on rapidly.

There was a peculiar condition on the anterior surface of the lens that could not be accounted for. On the inner surface near the edge of the iris there are a number of little dots which appear to be red in color. There were no adhesions apparently, at the time of first examination, the pupil was normal in shape and but slightly dilated. Reaction to light good and light perception and projection very good.

SECTION ON OPHTHALMOLOGY.

COLLEGE OF PHYSICIANS OF PHILADELPHIA.

Meeting November 15, 1898. Dr. George C. Harlan, Chairman, in the chair.

Rupture of the Iris and Choroid.—Dr. B. A. Randall reported the case of a boy struck in the eye by a stone three days before, in which there was partial paresis of the iris above and a pupillary nick below, and in the choroid near the disc three nearly parallel linear lesions. These streaks were not real ruptures of the coat but torsion injuries comparable to those reported by him in 1887. There was neither extravasation nor uncovering of the sclera in the affected areas, but merely yellow streaks that will doubtless undergo atrophy and pigment degeneration and present the appearance of total rupture. The macula was uninjured and V. nearly normal. Each lens showed a tiny extranuclear opacity, more pronounced on the uninjured side. They were probably congenital, but might readily be ascribed to the injury, hence from a medico-legal point of view assume considerable importance. (The patient has since been seen, twenty-six days after injury, and already shows nearly the typical appearances of choroidal rupture with degeneration of the margins.)

Dr. R. R. Tybout read, by invitation, a *Report on the Value of Pilocarpin in the Treatment of Diseases of the Interior of the Eye.* The speaker detailed a case of violent iridocyclitis in a man 31 years of age who had general ciliary injection, contracted pupils, extensive posterior synechiæ, and deposits on the posterior surface of the cornea. T. + 1.

V. R. 6/60, L. 6/24. The patient had been infected with syphilis eighteen months before and had been treated with mercury and iodids. Vision still further declined under a continuance of these remedies. After twenty-one hypodermic injections of gr. 1/8 of pilocarpin muriate, extending over seven weeks, and gr. 60 potassium iodid daily without mercury, improvement was rapid and pronounced. V. increased to R. 6/24, L. 6/15. There were no relapses, tension became normal, and the exudation was promptly absorbed. Six months later V. had increased to R. 6/9, L. 6/6.

Also two cases of episcleritis, both having received pilocarpin *locally* and one internally. In the first case, a woman, aged 31, the inflammation had persisted for four weeks, and recovery ensued under pilocarpin sweats in two weeks. She had no relapses during the following month that she continued under observation. In the second case, a woman, aged 27, the pain and signs of inflammation which had continued for eight weeks yielded to salol internally aud pilocarpin locally much less promptly.

Toxic Chromatopsia and Toxic Hysteria.—Dr. de Schweinitz related the history of a patient, aged 51, who asserted that his left eye had always been defective in vision and had practically been blind for eleven years, and whose right eye for eight weeks previous to examination had been affected with marked xanthopsia in the form of clouds of orange-colored smoke which passed constantly before it. With the exception of catarrh of the stomach, the patient presented no constitutional ailments, but had always been an excessive smoker and for part of his life a chewer of tobacco. He did not use spirits in any form. There was a typical relative central scotoma in the right eye, and in the left, or supposed blind eye, a scotoma could also be demonstrated in the center of the light field, which in its periphery was normal, just as the form-field in its periphery was normal on the other side. Under a regimen which consisted in abstinence from tobacco, full doses of iodide of potassium and strychnia, the patient improved, and in six weeks returned with the vision of the right eye normal, the chromatopsia gone, and the scotoma no longer demonstrable, or at least only a slight depreciation of color-sense in the old scotomatous area. Tests for feigned monocular blindness were now perfectly successful, and by all ordinary methods it was positively shown that the patient read as well with his left as with his right eye. There had never been any ophthalmoscopic changes of gross disease, probably only a slight flushing of the optic disks. There was also partial hemianesthesia of the face. The speaker compared the case to various forms of toxic hysteria as they are seen under the influence of lead, alcohol, mercury, bisulphide of carbon, and nitro-benzol. So far as his experience went, xanthopsia as a symptom of the toxic action of tobacco had been observed only once before.

Dr. William Campbell Posey contributed *A Clinical Study of 287 Cases of Hyperphoria.* The author endeavors to measure the deviation which the eye undergoes when it is screened off in the ordinary refraction test, whilst the other eye fixes the test-card sharply in the endeavor to obtain the best visual acuity. To accomplish this, the vision of the right eye is first obtained, the left eye being obscured by an opaque metallic disc. This done, the right eye is obscured by the disc and the left eye made to regard the chart. So soon as the vision of this eye has been obtained, instead of removing the shield from before the right eye and permitting the patient to bring the eyes into a state of parallelism by the unconscious desire for fusion consequent upon binocular vision, the patient is told to regard a bright electric light placed on a level with the line of test letters which he had just read and but a few inches from it, the right eye still being covered. The Maddox rod is then lowered before the left eye, the patient's attention called to the streak, the disc quickly removed from before the right eye and the patient requested to give the relative positions of the light and the streak; and deviations, lateral or vertical, are at once measured by means of the rotary prisms which are in position before the eyes.

As a result of his observations, which extended over 2,300 private cases of refraction, he deduced the following conclusions:

(1) Hyperphoria of 1° or more exists in about 13 per cent. of all cases of refraction, and, as regards its frequency, is independent of associated exophoria, esophoria, or lateral orthophoria. Hyperphoria occurred most frequently to the extent of 2°. (2) In general the degree of hyperphoria seems to bear a close relationship to the degree of esophoria and exophoria in any case, increasing or diminishing in proportion as the lateral muscular deviation increases or diminishes, but a high degree of esophoria or exophoria does not necessarily imply the presence of hyperphoria. (3) In like manner, high degrees of ametropia need not be accompanied by hyperphoria, for the author found an equal number of cases of both M. and H. of high degree in which hyperphoria was absent. In these latter cases, however, it was noted that there was but a slight deviation in the lateral muscles, while on the other hand it was found that high degrees of ametropia associated with high degrees of lateral heterophoria were almost always attended with hyperphoria. (4) In anisometropia, on the

other hand, hyperphoria is present in all cases where the difference in refraction between the eyes is at all marked, even when associated with a moderate degree of esophoria or exophoria. When there is lateral orthophoria, or but little difference in refraction between the eyes, hyperphoria is rarely present. (5) Strabismus, both convergent and divergent, is invariably accompanied by hyperphoria, of which at least one-fourth of its total amount is latent. (6) Latent hyperphoria is common and occurs independently of the state of the lateral muscles, although it is more frequent in exophoria (2 per cent.) than esophoria ($1\frac{67}{100}$ per cent.) or in lateral orthophoria ($1\frac{1}{8}$ per cent.). (7) Unlike latent H., latent hyperphoria develops quite independently of age. (8) The correction of errors of refraction is not sufficient in the majority of cases to bring about a disappearance of any existing hyperphoria, as the author has found that hyperphoria becomes more manifest the longer glasses are worn, whether vertical prisims have been incorporated into the formula or not. (9) Supraorbital headache is the most frequent symptom. In a small proportion of cases it will be unilateral, usually on the same side as the eye with the lower vision. Typical attacks of migraine may be expected in about 5 per cent. of all cases of hyperphoria. A symptom of frequent occurrence and of great value in directing the attention to the existence of hyperphoria consists in an associated reflex in the supply of the facial nerve. This may manifest itself either in a unilateral twitching of the lids as in nictitation, or more rarely by pronounced blepharospasm.

HOWARD F. HANSELL.
Clerk of Section.

HAAB reports the results of treatment in sixty-five private patients suffering from acute inflammatory and chronic glaucoma. He claims to have permanently cured about 62 per cent. of his cases, that is, he dissipated the tension. Eight cases recurred, but were relieved by myotics. In 91 per cent. vision was preserved as good as before the iridectomy, and in some cases it was even improved. He claims to have cured 20 per cent. of his cases of hemorrhagic glaucoma, which is a pretty large per cent., considering the experience of others. 40 per cent. of his cases of hemorrhagic glaucoma retained vision. In the latter variety of cases he prefers sclerotomy to iridectomy, as the severity of the intervention is less.

CORRESPONDENCE.

"EMMETROPIA, OR CORRECTED AMETROPIA.

To the Editor of the Ophthalmic Record:

Sir:—In the issue of the Ophthalmic Record of October, in the article "Emmetropia, or Corrected Ametropia," the following occurs: "When not complicated by pathological conditions, ametropia, in persons under fifty-five years of age, should not be considered as perfectly corrected if the distant vision, in the absence of accommodative effort, be less than six-sixths (six-sixths to six-ninths after the sixty-fifth year) with near vision lenses." This should be: "When not complicated by pathological conditions, ametropia, in persons under fifty-five years of age, should not be considered as perfectly corrected if the distant vision, in the absence of accommodative effort, be less than six-sixths with near vision lenses."

Norburn B. Jenkins, M.D.

Knoxville, Tenn.

"THE EDUCATION OF THE OPHTHALMOLOGIST" AGAIN.

To the Editor:—In the November issue of the Ophthalmic Record a correspondent, S. E. Cook, criticises a recent editorial by the writer as "pernicious teaching," "the legitimate result of which would be the rapid multiplication of ophthalmic colleges, refraction colleges, etc."

A careful reading, however, of that editorial convinces me that only hasty judgment and careless consideration of its statements could lead to such conclusions, and that the critic has wholly misunderstood its intention.

At the outset it was stated therein that "well balanced medical men disparage the tendency to specialism; they see in it a drift toward narrowness, superficiality and ignorant exaggeration, and insist, *with reason*, that the best preparation for following a specialty is a thorough education, supplemented by ten years or more of general practice." Again: "*It* *needs no argument* to demonstrate the value of such preparation for the recognition and successful treatment of maladies of the eye, so many of which are the result of systemic disease."

In spite of these plain statements my critic *does* deem an argument necessary, and setting up a straw man, proceeds to demolish it, seeking, among other things, to convict me of teaching that affections of the lens and retina bear no relation to physiologic laws.

A fountain cannot give forth at once sweet and bitter water, and the above quoted portions of the editorial should have suggested that those statements to which exception is taken only apparently conflict with them.

The critic vehemently combats the assertion that "ophthalmology is peculiar to itself in respect to the *study* (education is the subject of the editorial) of ocular physiology (in the sense of the focal and axial adjustment of the eye) and dioptrics, light and color perception, binocular vision, ophthalmoscopy, skiascopy, keratometry, perimetry, etc., and no amount of experience in other departments of medicine is of the slightest assistance in understanding them." Yet this is literally true. The context plainly indicates that the terms *ophthalmoscopy* and *skiascopy*, for instance, are used in the sense of *technical procedures*, and as parts of the theoretical training of the ophthalmologist. In Gould's Dictionary, under the head of "Ophthalmoscopy," *medical ophthalmoscopy* is defined as "Ophthalmoscopy as an aid to internal medicine," etc. It would be quite another thing to assert that *clinically* these procedures are unrelated and independent of the various departments of medicine.

The writer has taught ophthalmology for fifteen years, didactically and clinically, and his experience has taught him, contrary to the critic's contention, that the principles of theoretical ophthalmology, especially as found in the works of Donders and Landolt, are acquired with comparative difficulty after the age of thirty-five.

Lastly, the critic takes exception to the statement that "With a ground-work of physiology, chemistry, physics and mathematics, those branches of ophthalmology peculiar to itself can be mastered in a university preliminary medical course, and the time spent in a medical college actually shortened." Here the writer pleads guilty to having omitted to qualify a decidedly sweeping statement; he should have written instead, *the ground principles of those branches.* He had in mind the course of study provided in the undergraduate department of several of our universities, notably at Cornell, Johns Hopkins and Leland Stanford, in all of which it is known as the "medical preparatory course," and in the register of Stanford referred to as "A course which gives that foundation both in scientific knowledge and in skill in experimental physiology, and in histological and anatomical technique, which makes it possible to accomplish the medical course of the best medical schools in a shorter time and with much better advantage."

F. B. EATON.

706 Sutter St., San Francisco, Cal.

AT THE LAST MEETING of the *New York State Medical Society*, Dr. J. H. Woodward of New York City, read a very sensible paper on the "Course and Management of Cataract." The tone of the paper must commend itself to all thoughtful, conservative and experienced practitioners and should be a warning to those who believe in instantly calling all lenticular opacities cataracts and then proceed to distress the patient and his friends by premature operative suggestions. Dr. Woodward calls attention especially to the fact that many cases of senile cataract show but little if any progressive loss of vision, and that improvement even is often observed and that complete cataractous degeneration of the senile type was a process often requiring many years for its consummation. Dr. Woodward emphasizes the fact that as a failure in the nutrition of the crystalline lens is probably the cause of cataract, the nutrition of this part should be maintained to the highest possible point. Errors of refraction should be corrected, and every effort made to improve the general health and avoid eye strain. He believes that these patients should be allowed to read by a good light until they felt that the eyes were tired, but that they must then promptly discontinue using the eyes until again thoroughly rested.

AMONGST fifty-four cases of tabetic atrophy of the optic nerve, Silex found forty-four of them of syphilitic origin. Twelve had undergone thorough specific treatment, eight had been treated for years. He believes that even thorough treatment will not always relieve these cases. He found the treatment ineffectual. Electricity, iodide of potassium, strychnine, silver, etc., were administered in all possible ways. He concludes that the only possible means to retard the development of the affection is with strengthening therapeutics to tone up the organism, especially the nervous system.

NEWS ITEMS.

Personals and items of interest should be sent to
Dr. Frank Allport, 92 State St., Chicago.

Dr. de Beck of Cincinnati, Ohio, has been made a member of the Sociéte Française d'Ophtalmologie.

Dr. Geo. H. Stubbes of Birmingham, Ala., has been appointed Eye and Ear Surgeon to the Southern Railway, west of Atlanta.

By the will of the late Mrs. Annie S. Paton of New York City, the Manhattan Eye and Ear Hospital will receive $50,000.

Dr. Casey A. Wood has been appointed Professor of Clinical Ophthalmology at the Chicago College of Physicians and Surgeons (Medical Department, University of Illinois), Chicago.

Dr. John P. Davidson of Richmond, Va., has been elected Professor of Diseases of the Eye, Ear and Throat, in the Medical College of Virginia.

The medical staff of the Home for Friendless Women of Louisville, Ky., has just been organized. Dr. S. G. Dabney has charge of the Eye, Ear and Throat department.

Dr. Boyd of Leadville records over one hundred cases of inequality of the size of the pupils in that city, which is 10,000 feet above the sea level. He attributes it to the altitude, but cannot say "why."

At a meeting of the Philadelphia Ophthalmological Society held November 10th, Dr. George E. de Schweinitz presented some very interesting mounted specimens of sarcoma of the choroid and sectional drawings together with micro-photographs of stained specimens of metastatic carcinoma of the choroid. Dr. de Schweinitz believes his specimens to be the twenty-seventh on record. Glioma of the retina was also discussed.

PRELIMINARY PROGRAM of the Fourth annual meeting of the Western Ophthalmologic and Otolaryngologic Association, New Orleans, February 10th and 11th, 1899.

Dr. George T. Stevens of New York, will give the address before the Section on Ophthalmology.

J. Ellis Jennings, St. Louis,	Title later.
D. Milton Greene, Grand Rapids, Mich.,	Fifty mastoid operations, including four brain abscesses and one perforation of the sigmoid sinus.
W. L. Ballenger, Chicago,	Title later.
N. H. Pierce, Chicago,	Indications for operative interference in chronic suppurative otitis.
H. H. Brown, Chicago,	The etiology and importance of iritis.
Hal Foster, Kansas City,	Congenital nasal atresia.
Cassius D. Wescott, Chicago,	Some experiences with Dr. Gould's method of prismatic exercises.
H. V. Würdemann, Milwaukee,	A report on operative treatment of high myopia.
George F. Keiper, Lafayette, Ind.,	Treatment of diseases of the lacrymal duct by catophoresis with exhibition of cupped sounds.
W. H. Baker, Lynchburg, Va.,	Retinoscopy.
A. Alt, St. Louis,	The pathology of cataract.
E. E. Hamilton, Wichita, Kansas,	Refraction of trachomatous eyes.
S. S. Ledbetter, Birmingham, Ala.,	Keratitis herpetica.
J. J. Kyle, Marion, Ind.,	An ophthalmogist's experience with the army.
E. C. Ellett, Memphis, Tenn.,	Series of cases of malarial keratitis, with reports of blood examinations.
J. R. Robinson, Colorado Springs,	Title later.
G. A. Wall, Albuquerque, N. M.,	Retinal detatchment, loss of vision, recovery.
Casey Wood, Chicago,	Glioma of the medulla, with report of autopsy and microscopical examinations.
W. A. Fisher, Chicago,	Title later.
James M. Ball, St. Louis,	Large tumor of the brain encroaching on the motor area and causing few symptoms save optic neuritis, with remarks on the value of double neuritis as a sign of brain tumor.
L. R. Culbertson, Zanesville, Ohio,	Case of Bell's palsy and epilepsy cured by correction of ametropia and heterophoria.
Ellet O. Sisson, Keokuk, Iowa,	Injuries of the eyeball, with report of cases.
W. T. Groves, Eureka, Kansas,	Tuberculosis of tonsils, pharynx and larynx.
W. E. Driver, Norfolk, Va.,	Best vision after cataract extraction.

THE FOURTH VOLUME of the "Norris & Oliver's System of Diseases of the Eye," will appear about the first of the year. Everything has been brought directly up to date. No ophthalmologist can afford to be without this magnificent work.

THE FIRST Fall meeting of Washington ophthalmologists and otologists was held October 21st, and was presided over by its president, Dr. Swan M. Burnett. Dr. Newal read a paper on "Esophoria and Ciliary Spasm." Dr. Belt read a paper on "Inflammation of the Middle Ear."

THE COLUMBIAN UNIVERSITY HOSPITAL was formally opened for the reception of patients November 1st, 1898. The building is located within one hundred feet of the medical department and will accommodate thirty patients. It is a Baptist institution. The ophthalmologists on the staff are Drs. D. K. Shute, W. K. Butler and F. K. Newell.

UNDER SOMETHING of a reorganization of the Faculty of the N. Y. Post Graduate School, the Eye Department is under the charge of the following gentlemen: *Professors:* D. B. St. John Roosa, W. O. Moore, J. B. Emerson, F. Valk, E. S. Peck; *Adjunct Professors:* F. Van Fleet, A. E. Davis; *Instructors:* A. E. Adams, A. B. Deynard, D. Weisner, W. M. Carhart, W. W. Gilfillan, C. W. Kinnes, E. S. Thomson, C. A. C. Jones, G. B. McAuliffe, G. H. Cox, J. R. Nelson.

A NEW YORK OCULIST is reported in a scientific journal as saying, "that Americans are too reckless of their eyes in exposing them to the electric light rays, and if a reform is not had, a sightless race may be developed." "The proper thing to do," he adds, "is to abolish electric lamps altogether and substitute fluorescent tubes, which cost no more and give a steady light." It is said that arrangements are being made to light an entire block in New York by fluorescent tubes.

THE FRIENDS of Dr. W. H. Wilder of Chicago, have been pained to learn of the serious accident which nearly cost him his life. It seems Dr. Wilder endeavored to get on a grip car while it was in swift motion. He was dragged under and between two cars and carried in this manner for nearly a block, before the cars stopped and he was relieved from his precarious position. He was seriously injured and taken to the Passavant Hospital, but we understand is now improving. The RECORD extends to him its sympathy and best wishes for a speedy recovery.

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